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TOBACCO SMOKING AS A FACTOR IN THE PRODUCTION OF PEPTIC ULCER AND GASTRIC NEUROSIS*

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DURING the last few years there has been put forward, especially by German workers, some evidence that the use of tobacco plays a role in the production of peptic ulcer, gastric neurosis and even carcinoma of the stomach. Hyperacidity has long been considered an important factor in the etiology of ulcers and there is some evidence that the use of tobacco produces secretion anomalies in the stomach, among which hyperacidity is one of the most important. Crämer in 1907 studied 410 cases of tobacco abuse and found hyperacidity in 99 and outspoken acid gastritis in 22. Whether or not this proportion of hyperacidity cases is much above the normal is not stated.

It has been thought for some time that smoking increases the gastric secretions. In fact Claude Bernard stated, "L'excitation de la sécrétion salivaire détermine une activité plus grande de la sécrétion gastrique. N'en serait-il pas de même dans l'usage du tabac à fumer qui faciliterait la digestion et favorisant les sécrétions?" Whether or not this hypersecretion leads to hyperacidity or not is a moot question. In many cases it undoubtedly does, but in others hypoaoidity seems to be the result.

In June, 1925, Lickint¹ reviewed most of the literature on the effect of smoking on the stomach and came to the following conclusions:

1. Nicotine acts as a ferment poison and reduces the activity of pepsin and rennet.
2. The increased KSCN found in smokers' mouths arrests digestion.
3. Peristalsis is at first increased and later retarded.
4. Gastric motility will be increased or slowed down according to the type of secretion anomaly (hyperchlorhydria or hypochlorhydria), caused by the tobacco intoxication.
5. Tobacco, i. e., tobacco smoke, plays an etiological part in stomach neuroses, secretion anomalies, and gastritis, as well as in ulcers and carcinoma.

Adler², in an article on the stomach of cigarette smokers, describes a condition giving symp-

oms closely resembling peptic ulcer. Peristalsis is increased and spasmodic. He states, however, that the absence of increased acidity is an important differential point. If the patient stops smoking, even if only before the mid-day meal, this trouble clears up.

Rolleston³ describes a similar condition under the name of "tobacco dyspepsia," which he says is rare. Exaggerated vagal action from inhibition of the sympathetic leads to pylorospasm and symptoms closely resembling duodenal ulcer. The X-ray findings may even be suggestive of ulcer. The pylorospasm may also lead to hyperchlorhydria, particularly if cigars or pipes are smoked, increasing the difficulty in the differential diagnosis between this condition and ulcer. Oral sepsis and excessive salivation from the use of tobacco may be of importance in the production of gastritis.

Danielopolu⁴ finds that the stomach is paralyzed for an hour or more after smoking and that chronic dilatation may be the final result.

Although the evidence is conflicting, there seems to be reason to suppose that smoking may have some role in the production of peptic ulcer, possibly enough to explain the higher incidence in men than in women.

In the literature, no record of a statistical investigation of this subject was found and it was thought that such a study of the records of the Peter Bent Brigham Hospital might be of interest. Accordingly all the peptic ulcer histories in the hospital from 1913 through 1926 were gone over and the number of smokers noted. About a hundred histories of female cases were examined, but in no case was a history of tobacco noted and the rest of the work was confined to male cases.

Five hundred control cases were then selected at random from the general admissions, the only criterion of selection being that they be males between the ages of 20 and 60, which was the age group in which practically all of the ulcer cases fell. When an ulcer case was found outside of this age group, a control was selected of approximately the same age. It was found to be impossible to group the cases in any way according to the amount of tobacco used because of

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the inaccuracy of the histories on this point. Every case in which a complete history was given was placed in one of two groups, smokers or non-smokers. Unless it had been stopped for some time before the beginning of ulcer symptoms, any history of smoking placed that patient in the smoking class. The same method of interpretation was used in the controls as was used in the ulcer cases, and it was felt that, in this way, any error arising from inaccuracies in history taking or in interpretation would be present in both groups and would lead to no erroneous conclusions.

The use of chewing tobacco did not place a patient among the smokers. Sir Humphrey Rolleston states that tobacco chewing is absolutely without effect and, moreover, the small number of these cases did not warrant their consideration.

In view of Lickint's work, the gastric neuroses were also added to this work.

The data was collected and the proportions of smokers in ulcer cases, neuroses and controls computed as in the following tables. In deciding on the significance of observed differences between the various groups, the standard errors of these variations were computed and only differences between the various groups, the standard errors were considered significant. The statistical methods used were taken from Yule⁶. The method is, briefly, as follows:

p_1 = proportion of smokers in control group.
 q_1 = proportion of non-smokers in control group.
 n_1 = number of cases in control group.
 p_0 , q_0 and n_0 have similar meanings for the ulcer groups.

p_0 = proportion of smokers in both groups combined.

q_0 = proportion of non-smokers in both groups combined.

e_{12} = standard error of the difference between p_1 and p_0 .

p_0 is calculated from the observed data by the following formula, Yule, page 268.

$$p_0 = \frac{n_1 p_1 + n_2 p_2}{n_1 + n_2} \quad q_0 = 1 - p_0$$

e_{12} is obtained from the following formula, page 269.

$$e_{12} = p_0 q_0 \left(\frac{1}{n_1} + \frac{1}{n_2} \right)$$

The 500 control cases were used as a standard of comparison for each of the case groups. The results of the control series are given in Table I and their comparison with duodenal ulcers in Table II. Only cases in which a positive diagnosis was made are considered.

TABLE I

Controls

Total number of cases.....	500
Number of smokers.....	375
Number of non-smokers.....	125
% smokers.....	75%
p_1	0.75

TABLE II

Duodenal Ulcers

Total number of cases.....	265
Female cases.....	74
Male cases.....	191
History incomplete.....	13
Cases with complete history.....	178
Smokers.....	143
Non-smokers.....	35
% smokers.....	80%
p_2	0.80

$$e_{12} = 0.03$$

$$p_2 - p_1 = 0.05$$

This difference is less than three times e_{12} , the standard error, and hence cannot be considered significant.

Table III gives the results obtained on gastric ulcer cases. Doubtful cases are not included.

TABLE III

Gastric Ulcers

Total number of cases.....	174
Females.....	63
Males with complete history.....	66
Smokers.....	56
Non-smokers.....	10
% smokers.....	85%
p_2	0.85

$$e_{12} = 0.055$$

$$p_2 - p_1 = 0.10, \text{ a difference of less than 3 times } e_{12}.$$

Table IV combines all peptic ulcers. This was done on the theory that the increased number of observations thus attained might make the observed differences significant.

TABLE IV

Peptic Ulcers

Total number of cases.....	439
Females.....	137
Males with complete history.....	244
Smokers.....	199
Non-smokers.....	45
% smokers.....	82%
p_2	0.82

$$e_{12} = 0.033$$

$$p_2 - p_1 = 0.07, \text{ a difference of less than 3 times } e_{12}.$$

Table V shows the results on Gastric Neurosis.

TABLE V

Gastric Neurosis

Total number of males with complete history.....	68
Smokers.....	44
Non-smokers.....	19
% smokers.....	66%
p_2	0.66

$$e_{12} = 0.055$$

$$p_2 - p_1 = 0.093, \text{ less than three times } e_{12}.$$

These results show that in peptic ulcer and gastric neurosis there is not a significantly greater proportion of smokers than in the general

population. We can draw no definite conclusions from these figures as to the relative incidence of these diseases in smokers and non-smokers. These figures cannot be obtained because no record has apparently been kept in the Brigham hospital of the total number of male patients treated. I believe, however, that it can be shown in this case that the difference between these values is of no significance.

In looking over the data, it seemed that smokers had ulcers earlier in life than non-smokers. Accordingly, the ages of all ulcer cases were grouped in five year periods and the number of cases whose ages fell into each group tabulated, the smokers and non-smokers being considered separately. The mean age of each of these two groups was then computed and the difference compared with the standard error, e_{12} , obtained by the following formula, Yule, page 346.

$$e_{12} = \frac{s_1}{n_1} + \frac{s_2}{n_2}$$

where s_1 and s_2 are the standard deviations of the age distributions of smokers and non-smokers and n_1 and n_2 , the numbers in these groups. See Yule, page 134 and following.

If the mean ages differ by more than three times the standard error, the difference is considered significant.

Tables VI and VII give the age distributions of smokers and non-smokers with gastric and duodenal ulcer, together with a comparison of the mean ages of these two groups in each case. The ages are those at hospital entry, not ages of the beginning of the disease. This aspect of the problem was an afterthought and no data had been collected on the duration of symptoms in the duodenal cases. It is thought, however,

that the error introduced will be approximately the same in the smoking and non-smoking groups, and that while the absolute ages will not be accurate, the difference between the means of the two groups will approximate the true value. In gastric ulcers, as a rough check on this supposition, the age at the onset of the disease was determined as accurately as possible from the duration of symptoms. The results did not differ materially from those of Table VII and will be omitted.

TABLE VII
AGE DISTRIBUTION, GASTRIC ULCER

Smokers		Non-smokers	
Age	No.	Age	No.
25	3	25	1
30	4	30	0
35	6	35	2
40	9	40	1
45	11	45	0
50	12	50	1
55	6	55	2
60	3	60	0
65	1	65	2
70	0	70	0
75	1	75	1
Total	56	Total	10
Mean age	47.3 yrs.	Mean age	52.5 yrs.
$s_1 = 10.1$ yrs.		$s_2 = 15.2$ yrs.	
$e_{12} = 4.9$ yrs.		$M_1 - M_2 = 5.2$ yrs., less than $3e_{12}$	

In neither of these cases is there a difference between the means of the two groups that is greater than three times the standard error of the difference between them. Hence we cannot assume that smoking has any effect on the age of incidence of peptic ulcer, either gastric or duodenal.

SUMMARY

From an examination of the records of the Peter Bent Brigham Hospital of all male cases of gastric and duodenal ulcer and of gastric neurosis, with respect to the use of tobacco, and comparing them with 500 control cases selected at random from the general admissions, the following conclusions were reached:

1. There is no proof that smoking is of any importance in the etiology of peptic ulcer or gastric neurosis.
2. There is no proof that smoking has any effect upon the age of incidence of gastric or duodenal ulcer.

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- 4 Danielopolu: Compt. Rend. Soc. Biol., Paris, 1925, XCII, p. 635.
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TABLE VI

AGE DISTRIBUTIONS, DUODENAL ULCER

Smokers		Non-smokers	
Age	No.	Age	No.
15	1	15	1
20	10	20	1
25	17	25	2
30	19	30	2
35	23	35	4
40	26	40	4
45	16	45	7
50	9	50	7
55	12	55	5
60	5	60	0
65	4	65	1
70	1	70	1
Total	143	Total	35
Mean age	41.1 yrs.	Mean age	45.6 yrs.
$s_1 = 11.8$ yrs.		$s_2 = 11.8$ yrs.	
$e_{12} = 2.2$ yrs.		$M_1 - M_2 = 4.8$ yrs., less than $3e_{12}$	

**FURTHER STUDIES ON THE CLINICAL VALUE OF *B. ACIDOPHILUS* MILK
WITH SPECIAL REFERENCE TO THE BASIS OF SELECTION OF
B. ACIDOPHILUS STRAINS FOR THERAPEUTIC PURPOSES**

BY HARRY A. CHEPLIN, PH.D.

THE first systematic study in the field of intestinal bacteriology was carried out by Escherich, who made an extensive investigation of the micro-organisms in infants' dejecta, both in health and disease. He observed the great predominance of Gram-positive rods in the stools of healthy nurslings, but failed to isolate the organism which is the object of interest at the present time, namely, *B. acidophilus*. Through the classical researches of Moro this organism was added to the list of known intestinal bacteria.

The principal claim of *B. acidophilus* to distinction amongst the other known intestinal inhabitants lies in its ability to colonize within the enteric tract and exert a most profound influence upon the character of the fecal flora. It is now well-recognized that *B. acidophilus* is present in large numbers in the digestive tract of normal nurslings, whose resistance to the intestinal toxemia is at the lowest possible ebb. It would appear that the chief function of this characteristic and almost invariable infantile intestinal flora is to confer protection upon the young against the invasion of putrefactive bacterial types and disorders arising from the absorption of their toxins. The stools of healthy babies are yellowish in color, slightly acid in reaction, soft in consistency and free from offensive products of putrefaction.

The chief factor controlling the fecal flora of the infant seems to be dietary and as the diet changes and becomes more and more complex, there is a corresponding change in the kinds and relative numbers of intestinal bacteria, until finally the intestinal population assumes the mixed character of that of the average adult. The monotony of bacterial types so strikingly associated with the monotony of diet (milk) gives way to considerable variations in size, form and tinctorial reaction of the intestinal microbes. Briefly, these changes comprise a substitution of Gram-negative bacteria of the colon type for a considerable proportion of the Gram-positive organisms of the *B. acidophilus* type, as well as the appearance of Enterococci and putrefactive types such as *B. welchii*, *B. putrificus* and *B. proteus*.

Since the bacteria within the digestive tract procure their pabulum directly or indirectly from the diet consumed by the host, it is only logical to assume that there is a definite relation between the chemical nature of the ingested food and the metabolic activities of the intestinal organisms. The great majority of adults ingest

large, if not excessive, amounts of proteins which lead to the establishment of a strongly proteolytic flora and extensive intestinal putrefaction. Under such conditions of alimentation *B. acidophilus* is reduced to a minimum owing to lack of a suitable source of energy and the relative unavailability of the protein residue, which is easily attacked by the putrefactive types. *B. acidophilus* is strongly carbohydophilic and the ordinary carbohydrate content of the average adult diet is absorbed before reaching the colon wherein this organism normally vegetates. Of all the common carbohydrates, lactose and dextrin alone by virtue of their slow absorption, reach the colon where they perform the very important function of providing an available source of energy for the rapid development of *B. acidophilus*. Cheplin and Rettger clearly pointed out this relation by demonstrating a reducing substance in the feces of rats and man whose diet contained a sufficient quantity of lactose. Inasmuch as lactose is found only in milk and nowhere else in nature and since, furthermore, the milk intake is usually relatively low after early childhood, it is, indeed, reasonable to expect that the *B. acidophilus* dominating flora of the young child, whose diet consists chiefly of milk, should be gradually replaced by putrefactive microbes adapted to the new nutritive environment.

The harmful effects caused by pathogenic organisms are so obvious as to require no further emphasis. But it should be a matter of concern that the microbes which are normally present in the intestinal canal may occasionally bring about decidedly pathologic conditions. Booker claimed that *Proteus vulgaris* and certain streptococci may elicit diarrhea in infancy. Bertrand found *Proteus vulgaris* in each of his 55 patients suffering from diarrhea. Schumburg reported the same organism as the cause of poisoning following the consumption of sausages. Klein concluded that *B. welchii* is an important factor in the causation of infantile diarrhea, and Tissier described cases of acute diarrhea caused by this organism. Kendall and his associates and Smith gave expression to similar observations and views.

As early as 1868 Senator declared that the decomposition of proteins within the intestinal canal results in the formation of substances toxic to the host. Bouchard elaborated the theory of intestinal intoxication, claiming that the amount of putrefactive products eliminated in the urine was a measure of the degree of intestinal putre-

fection and called his measurements "Urotoxic coefficients." Combe, Herter and others have shown that the fecal flora of the adult is almost always largely putrefactive, producing distinctly toxic products and considerable amounts of gas in the intestine. The toxicity of some of these products of putrefaction may be easily demonstrated by feeding or injecting them into experimental animals. Distaso's experiments on guinea pigs proved that the presence of indican in the urine depends upon the presence of *B. coli* in the intestinal tract.

When Metchnikoff published his views on auto-intoxication, calling attention to a definite alleged relation between premature senility and intestinal putrefaction, it was hailed with considerable enthusiasm. He claimed that the proteolytic intestinal organisms are constantly producing substances which are absorbed by the host and which act as cumulative poisons. For years, the large intestine has been regarded as the most active microbial cesspool, furnishing the etiological factors responsible for many diseased states in man. It was the trend of medical thought that in whole or in part, at least, the absorption of bacterially split protein by-products was causing the premature onset of senile changes in the heart, kidney, brain, liver and arteries. Metchnikoff proposed to fight these proteolytic microbes on their own battle-field by the introduction per os of lactic acid bacilli and thus ushered in a new and important field of study, namely, bacterial implantation within the digestive tract for therapeutic purposes.

The empirical use of soured milks has been in common practice in widely separated parts of the world from time immemorial. The refreshing and fatigue-relieving effects from their use was recognized in Biblical times. Metchnikoff's advocacy of the employment of lactic acid bacilli as anti-putrefactive agents received world-wide notice. In fact, so general has the use of soured milk and of *B. bulgaricus* products become that the market is flooded with various commercial preparations in the form of powders, tablets and liquid cultures. Not only has it been claimed that beneficial results are obtained by the ingestion of *B. bulgaricus* milk, but that this organism itself exerts the same favorable influence by destroying harmful bacteria from the digestive tract, and thus preventing auto-intoxication.

It is now generally conceded, however, that Metchnikoff failed to attribute the beneficial clinical results to the proper micro-organism and that the administration of even extremely large doses of viable *B. bulgaricus* cultures exerts no influence whatever upon the intestinal flora. It has been conclusively demonstrated by Cheplin and Rettger in their recent investigations that *B. bulgaricus* cannot be acclimatized to the intestinal tract of either animal or man. These results are in harmony with those of Kulka, who

showed in his experiments upon man that *B. bulgaricus* cannot be recovered from the feces. Rahe failed to procure any evidence by feeding experiments that *B. bulgaricus* is capable of surviving in the lower intestines of man.

Cheplin and Rettger pointed out that bacterial implantation for therapeutic purposes is possible through the use of *B. acidophilus*, an organism of intestinal origin possessing the requisite qualifications for colonization and proliferation within the human enteron. These investigators were the first to point out, by controlled experiments, that the most effective method of transforming the fecal flora is through the use of milk cultures of *B. acidophilus* which were devised and employed by them in 1920. They claimed that the milk cultures markedly altered the intestinal flora from a preponderatingly Gram-negative to a strongly Gram-positive type, and that gas-producing and putrefactive organisms could be almost completely stamped out or replaced by the *B. acidophilus*.

The belief that a simplification of the intestinal flora is both possible and desirable, afforded a new avenue of approach to this complex subject. Viewed from this angle, the question naturally arose as regards the extent of the possible therapeutic merits which may be ascribed to a *B. acidophilus*-predominating fecal flora. Accordingly, Cheplin and Rettger made their first clinical application of the so-called *B. acidophilus* milk therapy early in 1920, treating over 60 cases. They reported that the oral administration of *B. acidophilus* milk often resulted in relief from chronic constipation, chronic diarrhea and mucous colitis; they also obtained beneficial results in the treatment of eczema referable directly to the bacteriology of the intestinal tract. These claims were since confirmed by Cheplin and Wiseman, Kopeloff and Cheney, Gompertz and Vorhaus, Cheplin, Post and Wiseman, and Bass, who reported the satisfactory treatment of chronic constipation and diarrhea with milk cultures of *B. acidophilus* reinforced with lactose. Norman and Eggston have given the *B. acidophilus* therapy a wide-spread application and strongly advocate acidophilization of the intestinal tract by means of milk cultures. Cheplin, Fulmer and Barney, in their studies on the effect of *B. acidophilus* milk upon a series of cases of chronic constipation and diarrheas, found that the milk cultures exerted a beneficial influence by removing the toxic symptoms and regulating the fecal elimination from the bowels. More recently Clark and Perry pointed out the clinical value of *B. acidophilus* milk in constipation and called particular attention to the strikingly beneficial results they obtained in the treatment of sprue and chronic diarrhea. Relief from chronic intestinal toxemia and stasis, even in the presence of intestinal adhesions, has been secured by Mizell upon feeding *B. acid-*

ophilus milk cultures. He also reported that chronic ileocolitis and colon stasis of undetermined origin, as well as secondary to intestinal adhesions, may be relieved by feeding *B. acidophilus* milk. Moriss reported six cases of chronic diarrhea, all of which were relieved. Improvement occurred in nine out of thirteen cases of chronic digestive disorders, characterized by gastric and intestinal gas, nausea and vomiting, sensation of fullness and discomfort and loss of appetite. There was improvement also in three out of four cases of obstinate constipation.

In view of the encouraging results which I obtained during the past seven years in connection with the clinical value of *B. acidophilus* milk, it was deemed important to continue the observations on a larger group of clinical cases. The chief aim was to implant *B. acidophilus* in the intestine and, while maintaining it as the predominant intestinal organism, to determine what improvements, if any, were manifested clinically. That is to say, the object was to establish, if possible, a correlation between a simplified aciduric flora and any changes which may be noted in the clinical picture. In conducting the feeding experiments presented in this paper, no difficulty was experienced in enlisting the friendly cooperation and advice of practicing physicians, who not only supplied me with many interesting and appropriate cases, but who also furnished clinical histories of the individual cases. Particular attention is called to the fact that no patient was accepted for treatment except through advice of a physician.

EXPERIMENTAL

The subjects were requested to bring to the laboratory at least one specimen of stool prior to commencing the treatment. In all of the accompanying curves the first evacuation represents the stool furnished before the patient received the milk culture. After the initial administration of the *B. acidophilus* milk, the patients were instructed to supply the laboratory with at least two specimens of stool each week. The milk culture, with or without stated amounts of lactose, was ingested daily in three equal doses, 2-3 hours after meals, in addition to the ordinary dietary regimen. Milk sugar was added

to the milk culture after the incubation period and the contents thoroughly shaken; some patients, however, preferred to add the milk sugar to water and drink the suspension separately.

No cathartics or laxatives were taken through the entire experimental period. In a few cases of chronic constipation of long standing, difficulty was experienced in implanting *B. acidophilus* owing to poor or sluggish motility of the intestinal tract. In such cases, enemata consisting, by volume, of 3-4 parts of warm water and one part of the milk culture, were employed. The culture was added to the water and thoroughly mixed with it immediately before administering the enema.

In the diarrheal cases the treatment consisted in the daily oral administration of the milk culture without any added lactose, owing to the fact that this sugar, when taken internally in sufficient amounts, exerts a laxative effect. Whenever peristalsis became too marked in any case, the volume of the culture ingested daily was reduced to 500 c.c.

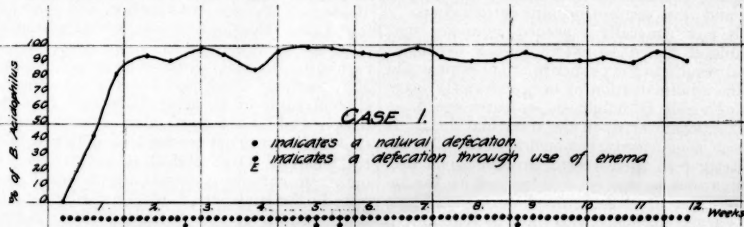
Through the entire series of experiments 22 subjects were employed. This investigation involved the preparation of 1800 liters of *B. acidophilus* milk and the bacteriological examination of 490 stools. From three to eight mixed strains of *B. acidophilus* were utilized in the preparation of acidophilus milk.

REPORT OF CASES

I have arbitrarily divided the cases in this study into two groups. The first comprises chronic constipation and intestinal stasis with the symptoms of so-called auto-intoxication, 18 cases; the second group includes chronic diarrheas and mucous colitis, 4 cases. Brief clinical histories of four illustrative cases of the first and two typical cases of the second group are given below together with treatment of results.

CHRONIC CONSTIPATION

CASE 1. *History*—White male, aged 42, employee at a bank, suffered from chronic constipation for at least five years, requiring daily laxatives and enemata twice every week. He complained of general discomfort after meals, bloating, belching of gas, foul breath and coated tongue, vertigo, hyperacidity in stomach, loss of vitality and personal initiative, and, what was most discouraging to him, inability to sleep



soundly and excessive fatigue during the day.

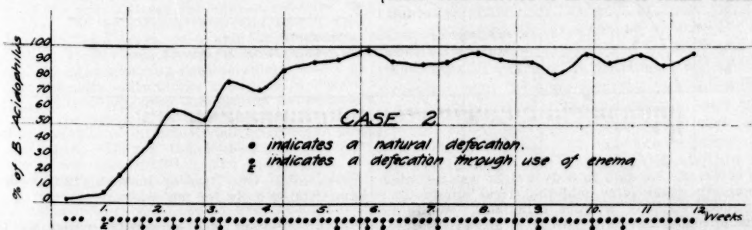
Treatment—Consisted of daily oral administration of one liter of *B. acidophilus* milk in addition to 100 grams of milk sugar. The patient remained under treatment 12 weeks.

Result—Throughout the entire period of the experiment the subject manifested a marked response. Within 24 hours after the initial ingestion of the milk culture the patient reported a natural bowel evacuation and continued to report at least one daily movement, and on several occasions two defecations, until the discontinuance of the treatment. Two weeks after beginning the treatment there was quite an apparent change in the patient's general health. By the end of the sixth week he reported complete recovery from belching of gas and disturbance in the epigastric region. His appetite was good and claimed to be free from the usual discomfort following a substantial meal. As the treatment proceeded he gradually indulged his appetite more and ate heartily of various articles of food, with apparent impunity, which hitherto he was compelled to forego in order to avoid intestinal distress. His headaches, vertigo and constant fatigue disappeared and he discharged his daily responsibilities with new vigor and ambition. There was a net gain of five pounds in body weight.

I am particularly desirous of emphasizing in this case the parallelism which existed between the improvement obtained clinically and the aciduric fecal flora strongly dominated by *B. acidophilus*. Within 10 days after the first consumption of the culture the bacteriologic examination of the stools revealed a marked transformation of the bacterial flora with a preponderance of *B. acidophilus*. By the end of the 17th day the gas-producing organisms (*B. coli* and *B. welchii*) had apparently completely disappeared and *B. acidophilus* reached a percentage level of 94, which it practically maintained with few exceptions throughout the course of the treatment.

CASE 2. History—White male, aged 35, had been troubled with constipation almost continuously since childhood, requiring laxatives regularly each day for the past 12 years. In spite of cathartics, he would go, not infrequently during the past year, two or three days without any defecation; dull and logy every day, complaining of loss in appetite and weakness. Headaches two or three times a week, which seriously interfered with his general efficiency and ability to work, frequently feeling extremely nervous and very apprehensive.

Treatment—One liter of *B. acidophilus* milk, reinforced with 100 grams of lactose, daily. After 10 days the amount of lactose administered was increased to 150 grams. Patient under treatment 12 weeks.



Result—Patient responded slightly during the first 10 days, having one small movement on each of the first and second days; none during the next 48 hours, requiring the use of an enema, resulting in a bowel

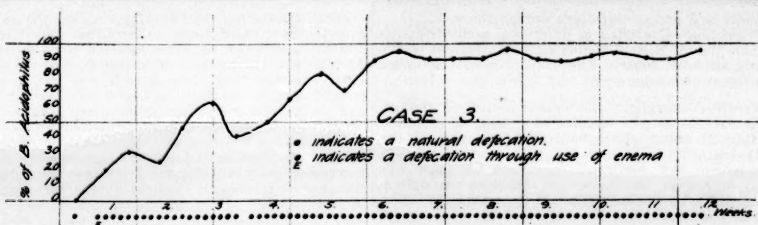
evacuation. During the following six days the patient experienced a daily desire to stool, but only unsatisfactory movements on each occasion were recorded. At this time the amount of lactose was increased to 150 grams and from then on until end of treatment patient reported at least one, not infrequently two, and on several occasions three fecal eliminations. Within six weeks the subject exhibited marked improvement and recovery of desire for food; the headache, bloated feeling and distress disappeared. Bowel movements were satisfactory five weeks after discontinuance of treatment. Patient gained three pounds in body weight. It is of interest here also to note that the improvement ran a parallel course with the transformation of the fecal flora.

CASE 3. History—White male, aged 38, a public school teacher, had been chronically constipated since boyhood. For 18 years had no action of the bowels except by means of cathartics, which were taken every night before retiring; troubled for the past five years with insomnia and felt ambition steadily waning to the point of seriously interfering with his professional work. He complained of persistent fatigue from morning until night, of sick headaches, nervousness and abdominal pains. The stool presented to the laboratory was highly desiccated, dark, almost black, in color, and very foul.

Treatment—One liter of *B. acidophilus* milk and 100 grams of lactose were administered daily. Patient under treatment 12 weeks.

Result—During the first two days there was no apparent effect upon the bowels. On the third day a copious movement was recorded, and daily evacuations were obtained for the following 17 consecutive days. At this stage the subject contracted a cold and was confined to his bed for three days, during which time only two small stools were reported. Since then and until end of treatment there has been a normal bowel movement daily. The stools became yellow in color, soft in consistency and inoffensive. After the sixth week the patient was very much encouraged over the results. At the end of the twelfth week, when the treatment was discontinued, the patient reported that he slept soundly and no longer experienced the previous feeling of fatigue during the day. A gain of two and one-half pounds in body weight was recorded. Attention is called to the correlation between the simplification of the intestinal flora and the first noticeable improvement in the clinical picture.

CASE 4. History—White female, aged 24, engaged in bookkeeping, offered a history of chronic constipation of about eight years' duration. During this entire period there were no natural movements. Various cathartics and laxatives, mineral oils and enemas were resorted to in order to obtain evacuation



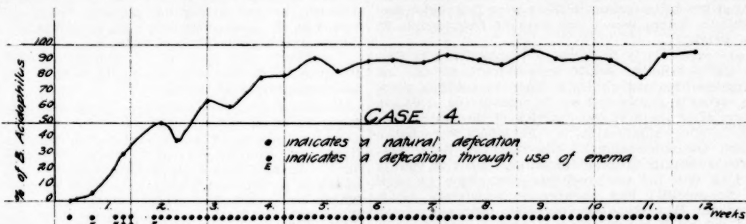
melancholia, headaches and a general feeling of malaise.

Treatment—One liter of *B. acidophilus* milk with 100 grams of lactose was ingested daily in the usual three doses. Patient under treatment 12 weeks.

Result—Subject responded slowly at the start, reporting only one natural elimination and another by means of enema during the first week. On the seventh day a second enema was administered which

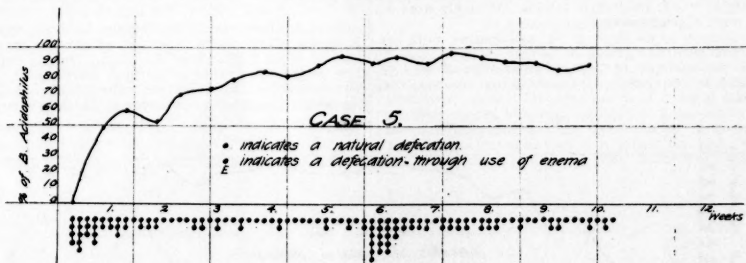
CHRONIC DIARRHEA

CASE 5. History—White male, aged 47, who was apparently in normal state of health up to within the last two years, when he was suddenly seized with an attack of acute indigestion followed by profuse diarrhea, pain and severe intestinal contractions. This condition lasted for about five weeks. Since then similar attacks came in cycles of from two to



resulted in a large movement. During the following week the patient reported two movements on each of the first and second days, none on the third and fourth days, necessitating use of enema, which yielded a copious evacuation. By the end of the second week there was complete regulation of bowel movements, which continued for the remainder of the experiment. It is of interest to note here, too, that concomitant with the transformation of the bacterial flora, relief from constipation and toxic symptoms

three months apart. Evacuations were accompanied by large quantities of mucus. On one occasion as many as 12 defecations were recorded. The first stool brought to the laboratory was watery, very putrid and mixed with considerable mucus. The bacteriological examination revealed a strongly dominating Gram-negative flora, consisting chiefly of *B. coli* and many other slender dysentery-like rods. *B. welchii* and streptococci were also present in rather large numbers.



was observed. No gain in body weight was recorded. Report six weeks later said that fecal eliminations continued regularly without cathartics. While no claim is made that this patient is absolutely cured of her constipation, it appears that regulation of bowel movements for a period of 16 consecutive weeks is directly attributable to the ingestion of *B. acidophilus* milk.

Treatment—One liter of *B. acidophilus* milk was administered daily for ten weeks.

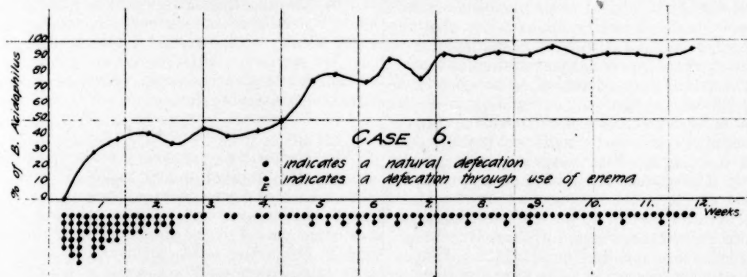
Result—Patient was extremely susceptible to *B. acidophilus* implantation. One week after the treatment began the stools were formed, averaging from one to two per day, and manifested a *B. acidophilus* implantation of about 85% by the end of the fourth

week. The patient claimed relief from abdominal distress. The mucus had disappeared. Toward the end of the sixth week he experienced a partial relapse, due in all probability to overconfidence in his improved condition and indulgence in heavy meals after midnight. There was a reappearance of mucus lasting three days. The subject was urged to reform his dietary habits, and within 10 days formed bowel movements, free from mucus, were voided. This condition prevailed for the remainder of the experiment. No gain in body weight was observed, but the patient claimed marked benefit eight weeks after discontinuing the treatment.

CASE 6. History—White female, aged 29, presented a history of gastro-enteric disturbances for the past six years, suffering from chronic diarrhea accompanied by painful intestinal and rectal contractions. It was not uncommon to have as many as 12 or 13 fecal passages two or three times a week; evacuations always diarrheal in character, at times blood-streaked, containing large quantities of mucus. Emaciated, weighing only 88 pounds, and physical examination essentially negative. The first stool brought to the laboratory was watery, bloody and extremely offensive in odor. Bacteriologically, the stool showed

reported, with but few exceptions, one natural and normal passage of the bowels free from blood and mucus. The physical improvement was marked; the subject ate and slept better and gained four pounds in body weight. Concomitant with this improvement there was a marked transformation of the intestinal flora as indicated in the curve. Four months after the treatment was discontinued a personal communication to the writer stated that the subject suffered one relapse—of short duration, however, and very much less acute than those experienced prior to the treatment.

Comment—From the general observations throughout this investigation, it seems quite apparent that the *B. acidophilus* lactose milk feeding usually exerts favorable effects in the treatment of intestinal conditions reported in this paper. In most of the cases the response was prompt, followed by complete regulation of bowel eliminations. Although in some cases the influence of the oral ingestion of the milk cultures in stated quantities was less pronounced at the start, quite an appreciable difference in the



a strong predominance of Gram-negative coli-like rods. The direct microscopic examination revealed undigested food particles and blood.

Treatment—Commenced with one liter of *B. acidophilus* milk. Within four days the quantity was reduced to 500 c.c. After the expiration of the fourth week, the amount of the milk culture was again increased to one liter. Patient under treatment 12 weeks.

Result—The patient reported five diarrheal bowel movements on the day before the experiment was started. Within 24 hours after the initial administration of the milk culture the subject recorded six defecations. On the second, third and fourth days the patient reported seven, three and six evacuations, respectively; stools were all diarrheal in character, at times bloody, containing considerable mucus. At this time the milk culture was decreased to 500 c.c. per day. Within ten days the patient experienced relief from the previous profuse diarrhea, but continued to complain of intestinal contractions and gaseous distension. During the following two weeks the subject was constipated. The implantation of *B. acidophilus* progressed rather slowly, never reaching a percentage level above 45. At this point the amount of the culture was doubled, and, within three days, the patient was relieved of constipation and flatulence. By the end of the fifth week the blood disappeared and the mucous discharge lessened. The fecal flora was gradually approaching complete simplification. Beginning with the seventh week until termination of the course of observation, the patient

effect on evacuation and the clinical picture was noted as the treatment progressed, especially after the 6th week. In several other instances, in which the treatment finally became effective, I have failed to observe a favorable reaction until after the expiration of from five to seven weeks; and again in a few exceptional cases there was no favorable response until 3 to 4 months after the initial administration of the milk cultures. It required considerable patience and perseverance on the part of these subjects to continue with the experiment, and were it not for the sincere co-operation and insistence of the physicians in charge, the treatment would have probably been dropped and the valuable information obtained with these obstinate cases completely lost. The slow response in each case was correlated with the extreme resistance to the implantation of *B. acidophilus* within the enteric tract.

Undoubtedly, individuals will vary greatly in their responsiveness to the *B. acidophilus* therapy. For such reasons bacteriologic analyses of the stools should be made at regular intervals, particularly in the obstinate cases, in order to follow intelligently the progress in the transfor-

mation of the fecal flora. This policy will be of great aid to the clinician in ascertaining the relative susceptibility or resistance in any given case to the *B. acidophilus* therapy and serve with equal efficiency in determining the dosage as well as the length of time that the treatment should continue. The *B. acidophilus* milk in changing the intestinal flora exerts a beneficial effect upon constipation by regulating the fecal eliminations from the bowel, while in the diarrheas and in mucous colitis its influence is manifested by controlling the discharge of mucus and changing the physical characteristics of the fecal material until soft, light and well formed dejecta result. Coincident with these regulatory phenomena, marked improvement is noted clinically owing to the relief from toxic symptoms which previously coexisted.

BASIS OF SELECTION OF *B. ACIDOPHILUS* STRAINS FOR INTESTINAL IMPLANTATION

From broad biological principles there is sufficient evidence to justify the assertion that the selection of suitable strains of *B. acidophilus* to be employed therapeutically should receive careful and detailed consideration. The specific efficacy of any alleged *B. acidophilus* milk depends on whether it is prepared with an organism definitely known to be *B. acidophilus* and which in turn has been experimentally proven to yield clinical results, or with an organism incapable of intestinal adaptation. It should be borne in mind that *B. bulgaricus* possesses nearly all of the characteristics by which *B. acidophilus* strains are ordinarily identified. Indeed, this similarity is so close as to have led Rodella, Heinemann and Hefferan and others to conclude that the two organisms were identical. This resemblance ever constitutes a menace to this mode of Bacteriotherapy and not infrequently leads to highly disappointing results. Not only is there danger in the possible mistaking of *B. bulgaricus* for *B. acidophilus*, but moreover not all strains of *B. acidophilus* itself are equally adapted for intestinal implantation.

In this connection, it should be mentioned that Cheplin and Rettger suggested that the close resemblance which exists between *B. bulgaricus* and *B. acidophilus* occasioned erroneous deductions by Metchnikoff. They pointed out that presumably Metchnikoff erred in accepting *B. bulgaricus* as the organism recovered from the stools of his patients when in reality it was *B. acidophilus*. This assumption is strengthened by the announced observations of Belonowsky, an associate of Metchnikoff, that the fecal flora of nursing mice was of the same character as that of the older mice receiving the *B. bulgaricus* milk cultures. I examined the feces of nursing mice on many occasions and found large numbers of *B. acidophilus*.

Following the above reasoning the question

naturally arises as to what shall constitute the criteria for the selection of effective strains of *B. acidophilus* that are to be used for therapeutic purposes.

In attempting to answer this question, I have made a comparative study of *B. acidophilus* and *B. bulgaricus* with the view of determining morphological and physiological limitations. In this investigation I employed 42 strains of *B. acidophilus* and 29 strains of *B. bulgaricus*. Thirty-one of *B. acidophilus* strains were isolated from fecal specimens of man and the remaining strains were procured from the feces of white rats. The isolations were made after the intestinal flora of both the white rats and the human subjects were transformed through the daily ingestion of lactose, from the usual mixed type to one dominated almost entirely by *B. acidophilus*. The technique is simple and was reported by Cheplin and Rettger in their earlier studies on the implantation of *B. acidophilus*. Of the *B. bulgaricus* cultures, twenty-one strains were received from various laboratories and eight strains were obtained from so-called commercial starters. All strains were subjected to re-isolation tests to insure complete freedom from contaminating forms.

MORPHOLOGY

The morphologic characteristics in all instances were studied at first in 24–48 hour old cultures which were subsequently kept under ice chest temperature for further observation. Without exception all of the strains of *B. acidophilus* and *B. bulgaricus* used in this study were rods with rounded ends. They varied in length from extremely short, ovoid forms, to long filaments, sometimes stretching nearly across the microscopic field. This was particularly true of old cultures in which almost all shapes and sizes were frequently noted. No motility was observed in hanging drop preparations and there was no evidence of spore formation. Tinctorially, all strains of the species under consideration retained Gram's stain and were uniformly stained with Loeffler's methylene blue when 18–24 hour old cultures were examined. On the other hand, older cultures often became Gram negative and showed distinct granulation.

Thus it is evident that *B. acidophilus* is morphologically and tinctorially indistinguishable from *B. bulgaricus*.

CULTURAL CHARACTERISTICS

The cultural characteristics of all members employed in this study were determined on casein digest agar, litmus milk, casein digest broth reinforced with various carbohydrates, and nutrient gelatin. All cultures were grown at 37° C.

Broth—After an incubation period of 24–48 hours in dextrose casein digest broth, the me-

dium became turbid and on longer standing would finally clear up due to the formation of a granular sediment at the bottom of the culture. Some growth, however, in most cases would remain adherent to the wall of the tube.

In general, growth in this broth (as well as in whey broth) presented essentially the same general characteristics for both organisms and is of no value in their separation.

Gelatin Slab Cultures—These were made from 18–24 hour old broth cultures and incubated at 20° C. for two weeks. Growth was very feeble along the line of puncture, with no evidence of development upon the surface of the medium. A few strains failed entirely to grow. None of the strains liquified gelatin. It would appear then that this medium is likewise of no assistance in differentiating between the organisms in question.

Colonies on Casein Digest Agar—The plates were incubated for 48 hours under aerobic conditions. The colonies formed by all members of both species are too small to be easily discerned with the naked eye. They can be readily recognized and counted with the aid of an ordinary hand lens which magnifies at least four to six times. For detailed study and observation of the colony, the microscope is essential.

There are two types of *B. acidophilus* colonies. One of these is characterized by its extremely irregular outline with innumerable hair-like projections or filaments radiating outward from a common center. The other varies from round to spindle-shaped, having an edge ranging from partly fringed to almost smooth. The former was arbitrarily designated by Horton and Rettger as the "X" type, while to the latter they applied the term "Y" type. I have observed all gradations between these two types of colonies, particularly in regard to the amount of fluffiness or beardedness as measured by the number and length of filaments projecting from the periphery. The variation in colony formation is apparently a constant phenomenon. Despite the fact that all of the 42 strains of *B. acidophilus* used in this investigation were originally isolated from decidedly fuzzy or the extreme "X" type colonies, the partly fringed or perfectly smooth "Y" type colonies frequently appeared in subsequent platings.

I have noted that in old or over incubated cultures there is an apparent shift from the "X" to the "Y" type. This change takes place somewhat regularly and the increase in the percentage of the "Y" type seems to be correlated with the increase in age of the culture. The factors which induce this change and the exact conditions that determine the type of colony are not known. A possible hypothesis is that the metabolic by-products, perhaps the acids in particular, may influence colony formation and that the "Y" type offers greater resistance to

such unfavorable environmental conditions.

All colonies formed by the *B. bulgaricus* strains are of the extreme "X" type, being decidedly fuzzy with indeterminate wisp-like margins. I have encountered no exceptions in the matter of colony formation by the 29 strains included in this paper, nor in any others which have come under my observation in the past.

Colony formation, therefore, offers no solution to the problem of separation of the two species.

FERMENTATION STUDIES

Many investigators have emphasized the fermentative action of these organisms upon various carbohydrates, higher alcohols and in milk as a basis of differentiation. Moro, the discoverer of *B. acidophilus*, claimed that the organism attacked glucose, sucrose and lactose without gas production. Kendall corroborated Moro's conclusion. Bertrand and Duchacek found that *B. bulgaricus* fermented lactose, glucose, galactose and to a lesser extent levulose and mannose, all without gas formation. On the other hand, the organism was unable to act upon sucrose, maltose, the pentoses, sorbitol and mannitol. Rahe reported that *B. bulgaricus* was unable to utilize maltose, while all of his strains of *B. acidophilus* readily attacked this sugar, and he suggested this carbohydrate as a possible means of differentiating the two species. Kulp and Rettger reported that all strains of *B. acidophilus* fermented maltose and sucrose and that all but two strains fermented unheated levulose. Of the seven strains of *B. bulgaricus* employed in their experiments only one was capable of fermenting sucrose and only two could attack unheated levulose; all but two strains failed to ferment maltose. Based on these findings they concluded that the action on maltose, sucrose and levulose appears to furnish a valuable means of separating strains of the two groups.

In this investigation the casein digest broth plus approximately 0.5 per cent of carbohydrates was adopted as the medium for the fermentation studies. All fermentable test substances were sterilized separately in a five per cent aqueous solution by intermittent sterilization to avoid possible decomposition. One cubic centimeter of the sugar solution was then added to each 10 c.c. of sterile casein digest broth with a sterile pipette, giving approximately 0.5 per cent concentration of the test substance. The media prepared in this manner were subsequently tested for sterility by incubation at 37° C. for 48 hours and at room temperature for about five days.

In the study of these organisms massive inoculations are essential in order to secure satisfactory growth within the required period of incubation. To obviate the possibility of transferring accompanying carbohydrate materials or other sources of energy from the seed culture

to the test culture, washed bacterial suspensions were used for supplying concentrated viable inocula. The bacterial suspensions were prepared by washing off with sterile saline the surface growths of large dextrose casein digest agar slants which had been incubated for 48 hours at 37° C. The suspensions were then centrifugalized and the bacteria subjected to two more washings with sterile salt solution. After the third centrifugalization, the supernatant liquid was removed and the well-packed organisms suspended in fresh sterile salt solution to give a degree of turbidity corresponding to tube 5 of the McFarland nephelometer scale; 0.1 c.c. of this standardized suspension was employed as the inoculum in all cases. The purity of the inoculum was determined by plating one small loopful on dextrose casein digest agar.

The action of the species under consideration upon the various test substances was determined by the drop in pH as measured by the colorimetric method of Clark and Lubs. All cultures were incubated 48 hours at 37° C.

Fermentation of Levulose—All of the *B. acidophilus* strains fermented levulose, while only three of the *B. bulgaricus* strains were able to attack this sugar. The fermentative action of these three strains was not as vigorous, however, as that of *B. acidophilus*.

Fermentation of Sucrose—Without exception all members of the *B. acidophilus* group gave strong positive reactions, while only three of the *B. bulgaricus* strains produced acid from this sugar. Incidentally, these were the same strains which were positive for levulose, although their action on sucrose was much stronger.

Fermentation of Maltose—This carbohydrate showed practically the same variation with *B. bulgaricus* as did levulose and sucrose. The three strains of *B. bulgaricus* mentioned above attacked maltose vigorously, while two other strains gave weakly positive reactions. The remaining strains failed entirely to act upon it. All strains of *B. acidophilus* readily attacked this sugar.

Fermentation of Other Carbohydrates—All members of the two species fermented lactose, glucose and galactose, while apparently none were able to break down xylose, mannitol, dulcitol, arabinose and rhamnose.

In the entire series of fermentation tests no gas formation by any of the strains of either species was observed.

Action in Litmus Milk—All *B. bulgaricus* strains vigorously fermented milk within 18 to 24 hours. The time required for clotting milk by the *B. acidophilus* strains soon after isolation from the fecal specimen ranged from 3 to 10 days. In this connection, it should be stated that all of the *B. acidophilus* strains were after prolonged cultivation finally able to coagulate milk within 18 to 24 hours at 37° C. This ac-

climatization to rapid growth in milk was accomplished by forcing the cultures through frequent transfers in milk. There was no formation of gas in this medium by any of the strains.

The total titratable acidity produced was determined by the usual titration method after the milk was firmly clotted. In carrying out this test, 9 c.c. of the milk culture were introduced into a white cup containing about 50 c.c. of distilled water to which a few drops of phenolphthalein were added, and vigorously stirred until the casein was thoroughly broken up. Tenth normal sodium hydroxide was used to arrive at the neutral point and the percentage of acidity calculated in terms of lactic acid.

B. bulgaricus strains developed an acidity ranging from 1.9 to 2.8 per cent, while that produced by the different strains of *B. acidophilus* varied from 0.65 to 1.0 per cent. However, some of the strains of the latter in my collection, now over four years old from date of isolation, are capable of producing an acidity of 1.5 to 2.1 per cent.

Comment—The results of this comparative study indicate a close resemblance between the members of *B. acidophilus* and *B. bulgaricus* morphologically and even culturally to a large extent. It has been stated that colony formation offers no ground for separation since *B. bulgaricus* and typical *B. acidophilus* are both of the extreme "X" type. The action upon levulose, maltose and sucrose seems to offer a valuable means of separating two species, but in view of the slight variations encountered in this study it would appear that even these tests can not be relied upon with absolute safety.

Furthermore, Kulp and Rettger have also reported that thermal death points, indol production and serological relationships showed no striking differences between the two groups. Albus and Holm found that in the media in which sodium recinolate was used as the depressant, *B. bulgaricus* was inhibited at a surface tension lower than 40 dynes, while *B. acidophilus* exhibited good growth in the same medium depressed to 36 dynes.

The most outstanding difference between the two types is in their natural habitats. A review of the voluminous literature on intestinal implantation of aciduric bacteria justifies the conclusion that *B. bulgaricus* does not survive the conditions of the enteric tract, while the implantation of *B. acidophilus* can be readily accomplished. It would seem then, that in implantation we have a method of differentiation which is most reliable. But even this method, although infallible for the selection of satisfactory strains of *B. acidophilus* for therapeutics, should not be regarded as absolutely dependable in separating *B. bulgaricus* from old laboratory stock cultures of *B. acidophilus*.

It has long been observed that artificial per-

petuation of any microorganism for a long period of time in other than its normal habitat tends to modify its adaptability to that habitat. In my experience during the past eight years I have observed that *B. acidophilus* cultures propagated on artificial media gradually lose their once potent adaptability to intestinal implantation. Beyond the fourth year from date of isolation from the fecal specimen this modification becomes increasingly evident. While old laboratory strains under my observation still continue to pass through the alimentary canal in fairly large numbers, decidedly more time is required to effect a complete transformation of the fecal flora as compared with strains that have been freshly isolated or kept under artificial cultivation for from six months to two years. It is conceivable, therefore, that old laboratory cultures of *B. acidophilus*, because of many years of sojourn outside the human body, may eventually become devoid of the important property of intestinal adaptability.

Inasmuch as it is now generally established that the *B. acidophilus* therapy depends upon the implantation of *B. acidophilus* within the recesses of the bowel, the final criterion for the selection of suitable strains to be employed therapeutically should be the adaptability of such strains to intestinal implantation and proliferation.

As a basis for the selection of strains of *B. acidophilus* for therapeutic purposes, I would suggest that the action upon levulose, sucrose, and maltose, and the surface tension test, be regarded as presumptive tests, and the ability to become implanted within the enteron to the exclusion of almost all other intestinal forms as the confirmatory test.

EVALUATION OF RESULTS

Considering the data herein presented, there is adequate evidence to invite the belief that *B. acidophilus* milk, prepared from carefully selected strains and employed in proper quantities, has important therapeutic properties. The maintenance of a *B. acidophilus* dominated flora within the large intestine, where the microbial cesspool is most active, appears to be of great significance both from the prophylactic and therapeutic points of view. We need but refer to the bacteriology of the intestinal contents of normal nurslings, whose resistance to intestinal toxemia is very low, to find that the aciduric organisms are in dominance and that the toxigenic microbes peculiar to the flora of the adult are suppressed. What explanation can be adduced for this phenomenon other than that the aciduric flora confers protection upon the young against the proliferation in the intestine of putrefactive forms? I am convinced that an aciduric flora is antagonistic to and incompatible with a putrefactive type of flora, and that the

establishment of a fecal flora akin to that of the infant is scientifically sound. Whether aging of the tissues, arteriosclerosis of old age, or premature senescence can be ameliorated or delayed by preventing intestinal toxemia, according to Metchnikoff's philosophy, cannot be stated on the basis of available data. The determination of this point will no doubt require a long time. We know, however, that we can reproduce the desired condition with *B. acidophilus* that was aimed at by Metchnikoff and his followers in the use of *B. bulgaricus*.

As with any other therapeutic agent, one must have a broad comprehension of the proper execution of the therapy and its limitations. It has been shown that the beneficial effects of *B. acidophilus* cultures are correlated with their ability to simplify the intestinal flora. Unless this is accomplished clinical results should not be expected. To bring about the desired radical changes in the flora, mass inoculation, (that is, a large number of viable organisms), carefully chosen with respect to their intestinal adaptability, is required.

Numerous experiments by various investigators have revealed that the intestinal flora can be transformed by feeding lactose alone. This requires a daily ingestion of the sugar of from 250 to 400 grams. Viable cultures alone, or cultures reinforced with relatively small amounts of lactose, will yield similar results in a shorter time. The feeding of lactose alone in the required amount for any long period of time is obviously impractical and its usefulness, therefore, will necessarily be limited. On the other hand, there can be no valid objection to the use of suitably chosen strains of *Acidophilus* bacilli alone or in conjunction with small amounts of lactose or dextrin for a long and, in fact, indefinite period, provided palatable and wholesome vehicles are employed.

Frequently in treating cases of obstinate constipation, it is necessary to increase the dose before regulation of bowel evacuations is obtained. It is quite likely that in cases reported as failures, a sufficient increase in the number of viable organisms administered might have resulted in clinical success. While it is difficult to arrive at a definite plan of standardization of mass inoculation, my experience would lead me to believe that the minimum average daily dosage should involve about 25-50 billions of viable organisms. When the total daily number of *Acidophilus* bacilli ingested drops materially below 25 billions, the therapeutic effects usually become less noticeable.

In general, 500 to 1000 c.c. of the milk culture will represent the average daily dose. In milder cases of constipation, diarrhea and mucous colitis, the above dosage of the culture alone will suffice or may even be reduced in many instances. For the chronic cases of intestinal stasis of long

standing, the culture should be reinforced with lactose in amounts ranging from 50 to 150 grams. After the desired change in the flora and regulation of bowel movements has been achieved, the sugar and finally the culture can gradually be reduced.

The culture should be divided in three or more portions and taken preferably between meals so as not to interfere with the appetite of the patient. In the event of any objection to a gain in body weight, the consumption of other foods should be reduced. While no special modification of the diet is required, it will be found an advantage to avoid a too generous consumption of animal proteins.

Obviously, individuals will exhibit variations in their reaction to this mode of treatment. No claim is made that all cases of gastro-intestinal disturbances will necessarily respond to the *B. acidophilus* therapy. It is not to be presumed that *B. acidophilus* is a "longevity bug" in the sense that *B. bulgaricus* was hailed. The *B. acidophilus* therapy may, however, in time be regarded as a link in the chain of long life in that it promotes general and continued good health. The fundamental principles on which this type of bacteriotherapy is based should be strictly adhered to if favorable results are to follow. Its range of usefulness seems quite clearly defined. I feel confident that we have at our command a therapeutic agent which merits attention and careful scrutiny.

A note of warning should be sounded against the formulation of opinion relative to the therapeutic effects of *B. acidophilus* cultures on the clinical effects obtained from a variety of fermented milks, labelled "*B. acidophilus* milk," which in reality are highly contaminated and far below the standard set by scientific laboratories.

It has been pointed out that the nature of the *B. acidophilus* therapy is bacteriologic, and that, other things being equal, the larger the number of organisms ingested the greater and more prompt will be the clinical effect. In other words, we are dealing in this therapy with a mass-inoculation phenomenon on the one hand, and with the utilization of carefully selected *B. acidophilus* strains of established intestinal adaptability on the other hand. Unless these important points are carefully safeguarded, the *B. acidophilus* therapy will eventually be unjustly discredited.

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STRANGULATED HERNIA IN THE AGED

BY CARL BEARSE, M.D.

THAT strangulated hernia is common among old people is well known, but that the prognosis is on the whole favorable is not so well understood. In fact, the writing of this article was in a measure influenced by the statement, "The prognosis of strangulated hernia is always serious, its gravity increasing as age advances," appearing in a recently published text book on hernia¹.

The observations to be made are based upon twenty-one cases of strangulated hernia in patients ranging in years from 65 to 94. These patients were seen from the years 1919 to 1926, and include not only private patients but also those personally operated upon in hospital practice.* Such aspects of strangulation as are common to all strangulated hernias will be omitted; only those phases of strangulation that pertain to the aged in particular will be discussed.

Cause of Strangulation in Aged: Work is not a factor, because these patients all led sedentary lives; nine were inmates of a home for the aged. Coughing due to chronic bronchitis and emphysema, increased abdominal pressure due to increased deposit of fat in the peritoneal cavity, laxity of abdominal muscles, and the greater straining action necessary in defecation and urination have all been advanced as etiological elements².

Duration of Hernia before Strangulation: While in some instances the hernia had only been observed for a relatively short time before strangulation, in most of the cases in this series it had been present for many years. In the hernias of long standing only an estimate as to the duration could be obtained, hence the many round figures in the following table.

TABLE 1

DURATION OF HERNIA BEFORE STRANGULATION

Patient	Age	Duration of hernia
1 I. K.	94	10 years
2 D. H.	86	40 years
3 E. K.	86	10 years
4 M. S.	85	20 years
5 R. S.	84	3 years
6 M. L.	82	40 years
7 G. S.	80	30 years
8 M. L.	79	20 years
9 M. F.	76	3 years
10 R. F.	75	50 years

*From the Surgical Service of the Beth Israel Hospital, Boston.

11 M. N.	75	20 years
12 S. F.	74	50 years
13 C. B.	72	20 years
14 M. Y.	70	Since childhood
15 M. S.	70	10 years
16 A. S.	68	Since childhood
17 A. K.	67	10 years
18 H. B.	66	8 months
19 G. B.	65	8 years
20 L. A.	65	6 years
21 E. F.	65	12 years

The average duration was over twenty-three years.

Sex: There were sixteen males and five females. All of the males had inguinal hernias; of the females, three had femoral, and two had inguinal hernias.

Interval Between Strangulation and Operation: The time elapsing between strangulation and operation is mentioned to show that this did not happen to be a picked group, under unusual observation. The shortest interval was one and one-half hours; this was in a patient already in the hospital for a decompensated heart. The longest period was three weeks. The majority were operated upon from 8 to 12 hours after strangulation.

Treatment: These patients were all operated upon under local anesthesia, novocaine (.5%) being used by the infiltration method. In no instance was it necessary to add a general anesthetic.

The operation, except for two cases that will be discussed later, consisted in the division of the constricting ring, followed by a classical hernioplasty. The hernial contents required no special treatment. Despite the marked congestion found in some instances, the normal color quickly returned upon the relief of the constriction. The explanation offered for the infrequency of gangrene is that due to the degenerative processes of old age the inguinal rings and muscles are lax.

In two instances abscesses were encountered, and these cases will be cited in detail.

CASE 1. Mrs. S. F., age 74, was admitted to the surgical service of the Beth Israel Hospital on October 24, 1925.

History: A left inguinal hernia of three years' duration became irreducible five days before admission to the hospital. There had been no bowel movements for the past three days, and there had been vomiting for the past four days.

Physical Examination disclosed a poorly developed and emaciated old woman. She was conscious and

rational. Temperature 100. Pulse 120. The neck had no rigidity. The sclera of the eyes was clear; the pupils reacted normally. The glands were not enlarged. The tongue had a thick dirty coat. The chest was symmetrical; the lungs were resonant throughout; the breathing was vesicular; there were râles at both bases. The heart was not enlarged, but had a soft, blowing, systolic murmur at the apex, which was transmitted to the axilla; $A_2 > P_2$. Blood pressure 140/70; hemoglobin 90%; white blood count 8500. In the left inguinal region there was a red, tender, fluctuant, and irreducible swelling, the size of a large orange. The extremities had no oedema; the knee jerks were active and no abnormal reflexes could be demonstrated.

Diagnosis: Strangulated left inguinal hernia with abscess.

Treatment: Operation was performed about one hour after admission, using novocaine (.5%) by infiltration. An incision was made parallel to Poupart's ligament and over the swelling. An abscess cavity was found which contained two ounces of thick, creamy pus, together with a small knuckle of sigmoid and epiplocae that were gangrenous. This segment of intestine, together with its accompanying epiplocae, and a large thick hernia sac were resected. No attempt was made at repairing the hernia; drainage was instituted and the wound left open.

Convalescence: There was practically no post-operative reaction. Two days after the operation feces escaped from the incision. This condition cleared up rather rapidly, and on November 16, 1925, 22 days after admission, this patient was discharged from the hospital with a wound that was practically healed. The bowels were moving by rectum, without the aid of cathartics or enemata.

CASE 2. Mr. M. S., age 84, was referred by Dr. W. D. Wheeler on June 18, 1924.

History: The patient had a small right inguinal hernia of about 20 years' duration. Three weeks ago this hernia became irreducible, and was reduced by a physician, under nitrous oxide anesthesia. He has been in bed ever since. Two days ago swelling of the right side of abdomen was observed, and this swelling has been increasing in size. The bowels have been moving fairly regularly, aided by enemata. There was a slight rise in temperature at the onset of symptoms, and this temperature has been as high as 102°.

Physical Examination disclosed a sick old man, sitting up in bed. He was well developed and nourished, conscious and rational, but weak, and looked septic. Temperature 101. Pulse 120. The eyes were clear; the pupils reacted to light and distance. The mucous membrane was dry. The tongue was thickened, dry, and covered with a thick dirty coat. The lungs had moist râles at both bases. The heart was regular, rate 120; there were no murmurs, and the sounds were of fair quality. The abdomen disclosed swelling, redness, and fluctuation on the right side, on a line with Poupart's ligament, the swelling going down to the groin, and extending up to the level of the umbilicus.

Diagnosis: Strangulated right inguinal hernia with abscess.

Treatment: Novocaine (.5%) was infiltrated into the swelling, and upon incising the skin and subcutaneous tissue, there was an escape of gas and about eight ounces of foul-smelling pus. No further surgery was attempted. Drainage was established and the wound left open.

Convalescence: There was considerable reaction, but when seen four days later the swelling had disappeared, and there had been no fever for 48 hours. There was but scanty drainage, with a slight fecal discharge from the wound. The local condition continued to do well, but unfortunately a broncho-pneumonia started up one week after the operation, and

the patient died from this respiratory infection two days later.

Comment: Unquestionably what happened here was that the reduction under nitrous oxide reduced not only the hernia but the constriction as well. The fact that there was no intestinal obstruction, together with the fact that there was an escape of gas upon incising the abscess indicates that a small segment of intestine must have been strangulated. The patient was kept in bed for three weeks before I saw him, and despite a suggestion that he sit up in a chair, he refused to do so. The pneumonia set in four weeks after the onset of symptoms. It does not seem unreasonable to conclude that could an operation have been performed promptly, and the patient gotten out of bed fairly early, this respiratory infection might have been avoided.

Post-operative Care: Since no general anesthetic was used, fluids by mouth could be given immediately—during the operation if necessary. The taking of plentiful amounts of water throughout the convalescence was encouraged. Upon being returned to bed the patients were placed on back rests and kept in this sitting position while in bed. On the third or fourth day they were moved to a chair, and this was repeated daily. At first the stay in a chair was from ten to fifteen minutes, and the time increased daily. The thought borne in mind was that the prevention of hypostatic pneumonia and the saving of life was more important than the result of the hernioplasty. The hospital stay varied from eight to twenty-three days, the average duration being about 17 days.

Food, cathartics, and enemata were prescribed as for any post-operative patient.

The wounds required no special care. The incidence of wound infection was no greater than in younger patients that had been operated upon under a general anesthetic.

Mortality: There were but two deaths in this series, and one of the fatal cases (Case 2), has already been cited. The other fatal case follows:

CASE 3. M. Y., age 70, was admitted to the medical service of the Beth Israel Hospital on September 9, 1925.

History: The patient complained of precordial and epigastric pain of two years' duration, but much worse for the past three weeks. He is short-winded both when walking and lying in bed. There is a right inguinal hernia of 50 years' duration.

Physical Examination disclosed a well developed and nourished, but anemic old man. He was conscious and rational. The sclera of the eyes was clear; the pupils reacted normally. The neck had no rigidity. The tongue had a thick, dirty coat. The lungs were resonant, the breathing vesicular; râles could be heard at both bases, more on the left. The heart borders measured 10.5 inches to the left and 2.5 inches to the right of mid-sternum. The action was regular, but the sounds were of poor quality, and distant. A short, systolic, blowing murmur could be heard best at the apex, and was transmitted to the axilla; the second sound was reduplicated. Blood pressure 138/80. The abdomen was large, full, tense

and tender. The liver was enlarged. There was a right inguinal hernia and hydrocele. The extremities showed oedema about the ankles, and also of the lower back; there was brownish discoloration of the legs. Urine examination showed few granular casts. Phenolsulphonphthalein test showed 5% at the end of the first hour and 10% at the end of the second hour—total of 15%. The NPN was 21 mgs.

On September 12, 1925, three days after admission, the hernia became strangulated. The patient was operated upon about one and a half hours later, at 1 A. M. Operation was performed under local anesthesia, novocaine (.5%) being infiltrated. Upon opening the sac, after dividing the constricting ring, a loop of small intestine measuring four inches was found. This intestine was slightly ecchymosed and bluish, but quickly regained its color. The intestine was replaced and a hernioplasty performed. The immediate reaction was satisfactory. At 9 A. M. the patient's condition became poor. The skin became cold, he was restless and noisy. His condition grew worse; at 1 A. M., 24 hours after the operation, the breathing became Cheyne-Stokes, and at 3:30 A. M., 26½ hours after the operation, he expired.

SUMMARY

1. This report deals with 21 patients above the age of 65 that were operated upon for strangulated hernia.

2. The cause of strangulation was either coughing due to chronic bronchitis or emphysema, increased abdominal pressure due to increased deposit of fat in the peritoneal cavity, or the greater straining action necessary in urination and defecation, due to laxity of abdominal muscles.

3. The average duration of these hernias before strangulation was over 23 years.

4. There were 16 males and 5 females. Two of the hernias were femoral; all of the others were inguinal.

5. The operations were performed under local anesthesia, novocaine (.5%) being used by the infiltration method.

6. The infrequency of gangrene and abscess formation, (there being only two such cases in this series) is explained by the laxity of the rings and abdominal muscles.

7. The post-operative care is of the greatest importance. Back rests were supplied from the very beginning, and patients were moved to chairs on the third or fourth day. The prevention of hypostatic pneumonia and the saving of life were considered to be more important than the result of the hernioplasty.

8. There were but two deaths. One was that of a patient already in the hospital suffering from a very grave cardiac lesion, who developed a strangulation. The other was of a man who had a reduction en bloc under nitrous oxide anesthesia, was seen for the first time about three weeks after strangulation, and was kept in bed a fourth week, refusing to be placed in a chair; he died of a broncho-pneumonia.

CONCLUSIONS

The prognosis of strangulated hernia in the aged is favorable, provided the patient is operated upon under local anesthesia. Careful attention should be paid to the after treatment, with particular reference to preventing hypostatic pneumonia.

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A HISTORY OF BLEEDING AND LEECHING*

BY TOWNSEND W. THORNDIKE, M.D.

The abolition of the lancet is now almost complete; yet for centuries phlebotomy was universally practised in the majority of diseases. In 1800 the bleeding shop was one of the institutions of the times and was visited in the spring and fall by people even in good health "to be bled," or as it was sometimes spoken of, "To breathe a Vein." Both medical and lay worlds seemed to be carried away with the popular idea that it was a necessary undertaking to keep them from foundering. The idea permeated the social and scientific fabric of the times, even insinuating itself extensively into the art and literature. Some of the records which the surgeons of that day have left behind them makes one shudder at the blindness with which, in defiance of the evil results, the use of the lancet was persisted in. Many illustrious persons were its victims; it would make an interesting list if compiled. The mania began to suddenly decline

about 1830. Many absurd reasons were given to account for the change. One such was that atmospheric conditions at the time of the advent of the cholera in 1830 in England produced such an asthenic type among the population that bleeding could not be borne. The true cause was the rise of clinical pathology and experimental physiology.

TRADITIONAL PERIOD

In the endeavor to trace the beginning of anything we immediately go to the banks of the Nile and to those of the Euphrates. The Greeks and Romans extol the antiquity, wisdom and scientific knowledge of the Egyptians which existed centuries before the advent of Hippocrates, and even what they have written about them probably falls far short of the truth.

The origin of bleeding is as old as trephining, and that is to say it is lost in the dim mist of pre-historic times. The theory as to its action

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was that in a diseased part there was a vicious substance which required removal.

Le Clerc in speaking of the discovery of bleeding, says, "A severe headache is often relieved by bleeding from the nose. What is more natural than that the process of relief should be initiated by the opening of a vein?"

The first phlebotomy was done by Podalirius, one of the sons of Aesculapius upon the daughter of the King of Caria, upon whose shores he had been cast by a tempest, after the ruin of Priam's Kingdom. This reference by Homer in the *Iliad* is about as true as anything that is not true can be. However, the fabulous story serves to prove the great antiquity of the practise.

ANCIENT PERIOD

The earliest reference I have found is a lapidary record *circa* 480 on a Greek vase which depicts a patient being bled. This is in a period before Aristotle (384-322 B. C.) had written his account of the blood vessels which is the most elaborate met with in the literature until Galen's description of them. In this account the differentiation between the veins and arteries was not mentioned, as this came later, although he gives indications as to the vessels from which blood may be drawn. He refers to cupping: "I saw a man who had glued on a bronze cup by means of fire." This is perhaps the earliest mention of cups worked by fire.

Medicine was far advanced in the days of Hippocrates, 460-377 B.C., and it is possible that he is the first writer to mention venesection. He also was familiar with cupping. In that delightful book of his, the "Aphorisms," there are several references to depletion. One is "Bleeding is best in the Spring to those that have occasion for it." Aegimios of Elis, 470 B. C., author of the first treatise on the pulse, opposed venesection, while Diogenes of Apollonia 430 B. C. who described the vena cava with its main branches, advocated the practise.

Celsus 25 B. C. 50 A. D. recognized the procedure, remarking "In blood letting the physician should not so much consider the age as the strength of the patient." He describes several kinds of cups in bronze and horn. Antyllus, *Circa* 250 A. D., whose name is still remembered in connection with the treatment of aneurysm by double ligature and excision, and his description of plastic operations, says there are three materials from which cups are made—horn, bronze and glass. He rejects the silver ones because they heat too readily. The bronze ones are the most commonly used. Glass is used where we wish to mark the quantity of blood extracted. Horn cups are useful about the head where the bronze ones would be difficult to remove; and also in the case of nervous persons who dread the flame.

The great Galen 130-200 A. D. whose writings dominated medical thought for a thousand

years, believed in venesection in selected cases.

Oribasius 326-403 A. D. who epitomized Galen and wrote a treatise on bandaging which was the text book on this subject for centuries, advocated scarification in the treatment of the plague and other diseases. He also described the method of cupping and the shape of the cups.

A good number of cups have come down to us and are scattered about in the various European Museums. The largest cup known is in the Museum at Athens. It is 16 cm. in height and was found in a tomb at Tanagra.

Bleeding cups occur on coins of Epidarus (300 B. C.) and other Greek cities. It is interesting to note that probably the first cups were gourds and the Latin word for cup *cucurbitula* signifies a gourd.

MEDIAEVAL PERIOD

1096-1438

Entering now the Middle Ages we find that the medical thought of Europe was the Greek doctrine of the four humors modified by the Arabic school. On this foundation rested the conception of disease and there is scarcely a malady for which bleeding is not recommended. This Greco-Arabic science found its chief settlement in the School of Salerno (ninth century). Here it held sway until broken by that extraordinary iconoclastic free lance, Paracelsus. This school was one of the great Mediaeval medical centres and seats of learning, "where the antique education never stopped, antique reminiscence and tradition never passed away and the literary matter of the pagan past never faded from the consciousness of the educated minds of the day." Here were to be found clinics, dissections, instruction and hospitals of all kinds, apothecaries, alchemists, etc. From here were sent forth translations of Rhazes, Avicenna and here was given instruction in the teachings of Hippocrates and Galen. One book of all others, however, spread the fame of this school—*The Regimen Sanitatis*—a poem on popular medicine. Many shrewd sayings from it have passed into popular use, such as "joy, temperance and repose, slam the door on the doctor's nose." It devotes five stanzas to bleeding, one of which is as follows:

By bleeding, to the marrow cometh heat,
It maketh cleane your braine, releeveth your eie,
It mends your appetite, restoreth sleepe,
Correcting humours that do waking keepe;
All inward parts and senses also clearing.
It mends the voyce, touch, smell, taste, and hearing.

In the Visi Gothic code, a seventh century collection of social-medical laws regulating medical practice very similar to the Code Hammurabi, it is stipulated that if the doctor injures a nobleman in venesection he had to pay one hundred soldi (about \$225). He was also forbidden to bleed a married woman in the absence of her relatives for fear of commission of adultery.

About 1210 A. D. the Guild of the Barber-

Surgeons was organized. Its membership was divided into the the Surgeons of the Long Robe and the Lay-Barbers or Surgeons of the Short Robe. By various decrees the latter were gradually forbidden to do any surgery except blood letting and wound surgery, cupping, leeching, shaving, extraction of teeth, giving of enemas. In fact the barbers up to the thirteenth century were primarily trained for the purpose of bleeding and shaving the Monks. Shaving had become the fashion since 1092, when the Monks were forbidden to wear beards.

RENAISSANCE 1438-1600

The practise of astrology and divination originally spread from Babylon to Greece and thence to the Roman Empire. It carried on into the Middle Ages as an active, aggressive cult and taught in the Medical faculties. The obsession permeated all diagnostic and therapeutic thought. Thus in the Mohammedan practise it was taught that "cupping is most effective at the wane of the moon, with the weather at set-fair, preferably the 17th of the month on a Tuesday." In the tract on Phlebotomy it can be seen how Paracelsus was dominated by astrological considerations.

One of the earliest printed documents relating to medicine was the "Calendar for Blood Letting" issued in Mainz in 1462. It indicated as in the drug store almanacs of today the parts of the body influenced by the different planetary conjunctions and signs of the Zodiac and showing the points of election for blood letting under these signs.

In the ancient days venesection had its opponents and supporters. This difference of opinion has come down to our own day. It constituted one of the most mooted points in the history of medicine.

In the beginning of the sixteenth century the ideas about depletion were undergoing a change. Hippocrates and Galen had advised to bleed largely from the arm on the affected side in pleurisy and pneumonia. That is, venesection on the same side as and near to the lesion. This method was known as the "revulsive" blood letting. The practise was gradually abandoned as Greek traditions were lost sight of, and finally the Arabs substituted for it something entirely different—namely, pricking a vein in the foot in order to let the blood flow drop by drop. This method prevailed throughout Europe until Brissot, 1514 A. D., a Parisian physician, revived the ancient (the Greek) practise during an epidemic of pleurisy and obtained such great success that he published his observation, highly commending the method. He created an uproar in the medical world. The innovation found foes and defenders. Disputes were many and vigorously fought. Finally the ancient method was generally revived.

Leonardo Botallo 1530 A. D. revived the dispute which had apparently quieted down for a period and recommended blood letting in almost all diseases, advocating the withdrawal of large quantities, especially in acute attacks. In La Sage's *Gil Blas*, there is a slap at the "fellows in this town calling themselves physicians, who drag their degraded persons at the Tail of the Cart of Antimony, . . . idolators of filthy kermes." In the figure of Doctor Sangrado, La Sage has characterized the physician as "the tall, withered, wan executioner of the sisters three" whose name has become a symbol for the kind of intensive blood letting which was rife in the seventeenth century. He reduced the old canon to death's door in less than two days by drawing off 18 good porringers of blood, with abundant drenches of warm water.

Guy Patin parallels this case by bleeding his wife 12 times for a fluxion in the chest, his son 20 times for a continued fever, himself seven times for a cold in the head. It is now known that the rationale of this extraordinary therapy (in able-bodied people) lay in the copious drafts of water which were given with it, acting as a kind of blood washing in the evacuation of peccant humors. In Italy the technique of the practise had become highly specialized, as we see in the copper plates of such books as Malfi's "*Il Barbiere*" (1626). Costly bleeding glasses of Venetian type were handed down in families as heirlooms. In Germany, perhaps for some temperamental reason, the degree of blood letting seems to have been less intense, although frequent enough, being a common detail in numerous bathing scenes. At these bathing resorts it was required to spend 124 hours in the water as a cure, with frequent cupping and venesection, set off by consumption of enormous quantities of food.

MODERN PERIOD (SEVENTEENTH CENTURY)

Thomas Sydenham 1624-1689 was an extensive but not an intensive blood letter, resorting to the operation, however, in almost every disease known to him but with discretion. But before he died he began to doubt its usefulness, and had he lived longer this open minded and practical physician would have probably cast it aside completely. In a letter dated March 10th, 1679, in treating pleurisy he said that the cure is to be sought in blood letting, but three years later he writes: "I judge it likely that diet, simple, cool and nutritious, might do the work of repeated bleedings and save the discomfort arising therefrom."

Benjamin Rush 1745-1813 was a blood letter. When sick, as he thought, with yellow fever, he consistently submitted to his own line of treatment by taking large doses of calomel and jalap, with copious blood letting.

In the early years of the seventeenth century occurred the rise of modern clinical medicine in

Paris. Corvisart, a pioneer in clinical teaching, whose method remains in vogue today in France—the ward visit, followed by a systematic lecture in the amphitheatre—with instruction on the teachings of Hippocrates three times a week—advocated depletion. Frank relates that he saw in his wards thirty patients bled out of a hundred and twelve. Corvisart, through his study of the heart, concentrated attention on the study of special organs.

We are all familiar with the scintillating stanza written by Doctor Lettson on himself

When people's ill, they comes to I,
I physics, bleeds and sweats 'em;
Sometimes they live, sometimes they die,
What's that to I? I lets 'em.

Lettson was a Quaker, went around in the garb of that sect and was even received at the Court in this habit. He had a large practise and gathered together a natural history collection. His museum was quite famous.

Louis, the founder of medical statistics as distinguished from vital, showed by statistical proof (1835) that blood letting is of little value in pneumonia and this did away with its abuse in that disease. Louis was the first after Floyer to use the watch in timing the pulse in which he was followed by the clinicians of the Irish, English and American schools. Through his American pupils, Holmes, the Jacksons and the Shattucks, and others, he exerted a powerful influence on medical science in the United States.

Hilton in 1892 in his "Rest and Pain" (one of the most readable books I know, and it should be placed by the side of Cheever's Lectures on Surgery for delightful reading) deals with the cause of "Bent Arm" following venesection. He says that the condition is rare as bleeding is not a common operation and remarks that it was nearly twenty years previous that he saw his last case of "bent arm" following phlebotomy.

I have now come down to contemporary times. The practice is still resorted to in some conditions of hypertension and occasionally as a last resort to stop convulsions of eclampsia by depleting. Sometimes sporadic cases come under observation that have been bled, cupped and leeched by some of the older doctors, usually of foreign birth and training. The peasantry of Europe still sometime resort to it as a popular means of recovering health. There are still men living amongst us who used bleeding in their early practice before the procedure became abandoned. It is of considerable interest, therefore, that I report the following personal communications from two of our most distinguished and delightful members of the medical profession: Dr. George W. Gay and Dr. Charles M. Green.

Doctor Gay says.

"In my younger days in the profession I was familiar with the use of leeches and wet and dry cups. Less so with phlebotomy, as I was a little late to see it used pretty generally in acute affections. It has

always been resorted to in certain conditions with marvelous relief, as in acute congestion (?) of the lungs, oedema of the lungs, in the early stages of pneumonia, etc. Perhaps it has been too much neglected, although it is not wise to be too dogmatic in any opinions these days!

"Wet and dry cupping were common enough in my young days for pain in various parts of the body. It was done with cupping glass and pump, but more frequently outside of hospitals, with a wineglass or an ordinary tumbler. A few drops of alcohol were put in the glass and ignited with a bit of paper. The glass was quickly applied to the part. As the air cooled, the soft parts rose and became markedly congested. That was dry cupping. The part could then be scarified with a lancet, or better, with the scarifier which worked with a spring making six (?) small incisions of the requisite depth. The cupping glass was then again applied and left on as long as desirable. I have seen this operation give much relief in various obscure pains.

"Perhaps leeches were more commonly resorted to than cupping. They were more provocative of profanity—pardon my impatience—as the little devils were prone to bite anywhere but where you wanted them to! The best way was to get a droplet of blood from some one and apply it to the exact spot desired. In that way the object was usually readily accomplished. They, too, often gave great relief. I remember applying two or three dozen leeches to a woman's abdomen at one sitting for general peritonitis! It was done by the advice of one of our leading physicians, but I am sorry to say that it did no good, as might be expected in these days. We had not got as far as laparotomy for salpingitis, appendicitis, etc., at that time."

Doctor Green says:

"I used to do cupping in my house-officer days, by direction; but it was dry cupping; the scarifier was not used. Cupping seems to have passed out soon after. This was in the late seventies.

"The use of leeches continued longer. As a house officer I was directed to use leeches to reduce pelvic congestion and inflammation; and in my early practice I continued the practice. The leech would be applied to the cervix. Once I lost a leech, who made his way into the uterus; but to my relief he backed out, and all was well. This was before the day of the hot vaginal douche, which superseded the leech, and apparently reduced pelvic congestion much more satisfactorily."

I have mentioned that there are innumerable references in lay literature bringing in blood letting as practised during its day.

The following two extracts are characteristic:

In speaking of the "gross ignorance of the barbers," a facetious author says, "This puts me in mind of a barber, who, after he had cupped me (as the physicians had prescribed) to turn away a catarrh, asked me 'If I would be sacrificed?' 'Sacrificed?' said I. 'Did the physician tell you any such thing?' 'No (quoth he), but I have sacrificed many, who have been the better for it.' Then, musing a little with myself, I told him, 'Surely, sir, you mistake yourself, you mean scarified.' 'O, sir, by your favour (quoth he) I have ever heard it called scarifying; and, as for scarifying, I never heard of it before.' In a word, I could by no means persuade him but that it was the barber's office to sacrifice men. Since which time, I never saw any man in a barber's hand, but the sacrificing-barber came into my head."

"The late Lord R—, with many good qualities, even with learning and parts, had a strange desire of being thought skilful in physic, and surgery, and

was very expert at bleeding. Lord Chesterfield, who knew his foible, and, on a particular occasion, wished to have his vote, came to him one morning, and, after having conversed upon different subjects, complained of the head-ache, and desired his lordship to feel his pulse. It was found to beat high, and a hint of losing blood given. I have no objection, and, as I hear your lordship has a masterly hand, will you favour me with trying your lancet upon me? 'A-propos,' said Lord Chesterfield, after the operation, 'do you go to the house today?' Lord R— answered, 'I did not intend to go, not being sufficiently informed of the question that is to be debated; but you, who have considered it, which side will you be of?' The Earl, having gained his confidence, easily directed his judgment; he carried him to the house, and got him to vote as he pleased. He used afterwards to say, that none of his friends had done as much as himself, having literally bled for the good of his country."

ORIGIN OF THE BARBER'S POLE

The use of the pole seen before barber shops today is of medical origin. It is explained as follows: the pole represents a stick held in the hand of the patient being bled and the red and white spiral stripes represent blood and bandage respectively. On some poles there is a blue stripe which represents venous blood. On top was placed a basin with a semicircular gap on one side. This vessel was to keep the clothes of the patron of the shop from being soiled (Cervantes in *Don Quixote*, makes use of this basin in his account of the episode of the "Helmet of Manbrino.") With a galipot instead of a basin, the pole was a sign of the surgeon, extensively used throughout Europe. Without either, the pole has become the sign of the present day barber.

In the "British Apollo," fol. Lond., 1708, No. 3, appears the following question:

I'd know why he that selleth ale
Hangs out a chequer'd part pale;
And why a Barber at port-hole
Puts forth a party-coloured pole?

Answer

In ancient Rome, when men lov'd fighting,
And wounds and scars took much delight in,
Man-menders then had noble pay,
Which we call Surgeons to this day;
'Twas order'd that a huge long pole,
With basin deck'd, shou'd grace the hole.
To guide the wounded, who unlopt
Could walk, on stumps the other hopt:—
But, when they ended all their wars,
And men grew out of love with scars,
Their trade decaying, to keep swimming,
They join'd the other trade of trimming;
And to their Poles to publish either,
Thus twisted both their trades together.

LEECHING

The word is from the Anglo-Saxon verb "*lœce*" to heal; and this name became applied to the Anglo-Saxon Leechdoms or methods of cure. The origin of the introduction of leeches into the practise of medicine is uncertain. They were known to the ancients under the name of

hirudo. Thus Horace says: "He won't let go of the skin until the leech is full of blood."

In medicine the leech was not known until a late date. If leeching was practised in the days of Hippocrates, we would reasonably expect to find it spoken of in his exhaustive medical writings, but he is silent on this matter. The first mention of the procedure that I have been able to discover is by Nicander of Colophon, 185-138 B. C., who wrote on the treatment of bites of venomous animals. He was a poet surgeon, writing his work in hexameters. Two of his medical poems have been printed several times. He refers to the use of leeches.

Themison, a physician who resided at Laodicea in the first century before the Christian era in his writings treats of the medicinal value of the leech. It was often his practice to apply an exhaust cup over the bites of the leeches. The reputation which Themison possessed was sufficient inducement for others to try the success of the practice, and it consequently came into general estimation. Galen was convinced of its utility, as appears in his works.

From the time of Themison, we find Roman, Grecian and Arabian physicians highly in favor of leeches and the illustrious name of Pliny adds force to the recommendation. The latter states that animals were often cruelly tormented by them when they swallowed any of these worms in their water. These early and mediaeval writers describe the use of the leech as well as the modes of keeping them, and meeting the casualties which might occur when employing them.

In England, while leeching was common, it was not so much used as the lancet. Broussais (1772-1883) held that nature had no healing power and it was necessary to abort disease by active measures. To this end he resorted to powerful weakening regime, the main features of which were to deprive the patient of his proper food and to leech him all over the body; as many as 30 to 50 leeches were applied at once. Baas records that "In the year 1733 41,500,000 leeches were imported into France. In 1824, two or three millions were sufficient to supply all demands. They are still used in the United States occasionally. Patients are chiefly emigrants. They can be bought in Boston at one or two drugstores at about seventy-five cents a piece. Two or three years ago I saw in Oregon a jar full of these annelids. The proprietor told me that he sold them to the inhabitants quite frequently for home treatment."

Case Records
of the
Massachusetts General Hospital

ANTE-MORTEM AND POST-MORTEM RECORDS AS USED IN
WEEKLY CLINICO-PATHOLOGICAL EXERCISES

EDITED BY R. C. CABOT, M.D.

F. M. PAINTER, A.B., ASSISTANT EDITOR

CASE 13381

ABDOMINAL PAIN AND NIGHT SWEATS

MEDICAL DEPARTMENT

A Lettish carpenter of forty entered October 11 complaining of epigastric and general abdominal pain after meals and night sweats.

For five months, following one of his usual colds, which had been very frequent for twelve years, he had been unable to work because of epigastric pain aggravated by food. He was nauseated but did not vomit. He walked the floor for relief. The pain was worse at night. For the past week it had been worse. It was more or less constant in the epigastrium, with lightning-like radiations over the abdomen and the left chest. Since the onset he had had night sweats and "tightness" of the abdomen relieved by passage of flatus. He felt better after the sweats. He had done practically no work since the previous winter because of the season and his condition. September 22 a left inguinal gland and September 28 a right supraclavicular gland were removed for biopsy at a hospital. For twelve years he had had frontal and vertical headaches, especially during the winter, accompanying colds. His usual weight before the present illness was 156 pounds. Six weeks before admission he weighed 138.

Until he was nineteen he had nosebleeds, especially in hot weather. Since he was nineteen he had had practically none. Sixteen years before admission he was injured by a trolley pole's falling on his head. Seven years ago he had influenza. Since May his bowels had been constipated. There was a question of hemorrhoids.

He formerly used beer. He only occasionally used a little alcohol. Since the onset of the present illness he had slept only after a sweat.

His father died at eighty-five of "nerve sickness." An uncle in Europe had cough (tuberculosis?).

Examination showed a poorly nourished, poorly developed man with moist hot skin and pale mucous membranes. There was marked pyorrhea. The throat was slightly red. The tonsils were atrophic. The chest was flat. *Lungs*: Flat apices? Negative. The location of the apex impulse of the heart is not recorded. The action was regular. The left border of dullness was 10

centimeters from midsternum, one centimeter outside the midclavicular line. There was no other enlargement to percussion. The pulmonic second sound was greatly accentuated. There was a blowing systolic murmur at the apex and louder at the base. The blood pressure was 100/50—80/50—140/70. The abdomen was level, questionably soft, with vague tenderness throughout. The liver edge was palpable three centimeters below the right costal margin in the mammillary line. The spleen was palpable. Rectal examination, extremities, pupils, fundi and reflexes were negative.

The urine was normal in amount, specific gravity 1.016 to 1.030, neutral at two of nine examinations, alkaline at two, bile once. Sediment showed one to very occasional leucocytes per high power field twice, very occasional red blood cells once. The blood at entrance showed hemoglobin 70 per cent., 5,800 leucocytes, 51 per cent. polynuclears, 26 per cent. large mononuclears, slight central achromia, possibly some immature leucocytes. Many vacuoles in cytoplasm and nuclei. A few showed pseudopodia. One mononuclear apparently contained a red blood cell. Appearance consistent with large mononuclear phagocytes. October 15 a few large mononuclears showed pseudopodia; one contained red blood cells. October 19: slight central achromia, one definite red cell engulfed by a phagocyte (?). October 24 and November 10: No inclusions found. Several large mononuclears showed pseudopodia and vacuoles. November 12 reticulated cells 1 per cent. November 20 hemoglobin 55 per cent., leucocytes 2,350, 56 per cent. polynuclears, 26 per cent. lymphocytes, 16 per cent. mononuclears, 3,080,000 reds, some central achromia, no phagocytes with inclusion bodies seen, platelets normal. December 10 hemoglobin 40 per cent., leucocytes 1,900, 52 per cent. polynuclears, 39 per cent. neutrophils, reds 1,552,000, some central achromia, slight poikilocytosis, very occasional large mononuclears seen with a pseudopod process, a questionable normoblast seen, very occasional basophils, no other immature forms and no parasites seen, platelets very low normal. Three Wassermanns strongly positive, one moderately positive. Blood cultures October 14 and 19 showed no growth. Widal negative for typhoid and paratyphoid A and B. Gastric analysis. Fasting contents: free acid 6, combined 10, yeast +, guaiac negative. Test meal: free acid 17, combined 30, yeasts ++, guaiac negative. Serum calcium October 25 8.2 milligrams per 100 cubic centimeters, October 29 8.0, November 5 8.9. Serum phosphate October 25 6.15, October 29 3.01, November 5 3.01. Basal metabolic rate +21, pulse 88, weight 57 kilos, temperature 101.2° before, 102.1° after.

X-ray October 13. Both diaphragms were in the usual position. There is no fluoroscopic note as to excursion. Costophrenic sinuses clear. There were a number of calcified glands in both

hilus regions. The left apex was slightly less radiant than the right, but this was thought probably of no significance. The lung fields were clear. A barium enema and films of the gall-bladder showed no definite evidence of pathology. A second, third and fourth chest examination confirmed the first. There was no positive evidence of tuberculosis. A barium meal showed the stomach normally filled out. Satisfactory examination of the posterior wall could not be made because the patient was unable to stand. No filling defects were seen. The duodenal cap filled spontaneously and was normal in contour. The head of the barium column was in the cecum. The cecum was normal.

Consultants: Surgical: "Am unable to make a diagnosis, but consider tuberculosis probable. Would be disinclined to explore abdomen." South Medical: "No confirmatory clinical evidence found to support positive Wassermanns." Cardiologist October 23: "I can find no evidence of heart disease, which should be found if subacute bacterial endocarditis has been in progress for five months."

The temperature was 98.7° to 105°; from October 23 to November 1 never below 101°, after November 7 generally above 101°; a terminal drop to 98.3°. The pulse was 70 to 140. The respirations were 16 to 37, with a terminal increase to 48.

Examination October 15 showed the heart sounds rather weak. There was definite tenderness in the epigastrium. The fingers and toes had rather spatulate ends but were not definitely clubbed. There was definite pallor.

October 20 a gland was removed from the neck for biopsy. October 22 there was no epigastric tenderness. November 8 there had been no appreciable change in the condition for two weeks except that both the leucocyte count and the red count were lower. November 18, however, the patient was much weaker and gradually going downhill. The abdomen was distended, with shifting dullness and fluid wave. He became jaundiced. November 27 there were râles at the left base. He spoke only in a whisper. He slept most of the time. November 23 and 27 neoarsphenamin 0.3 gram was given and December 1 0.45 gram. He was given two ultraviolet radiation treatments, although the X-ray Therapy Department considered him too ill to treat. He failed rapidly. The abdomen became less distended. December 11 he died.

DISCUSSION

BY RICHARD C. CABOT, M.D.

NOTES ON THE HISTORY

What sort of guess do you make when you hear that a person gets relief of epigastric pain or any other abdominal pain by walking? You cannot conclude a great deal, but there are certain possibilities. Has anyone a suggestion?

A STUDENT: Distention pain.

DR. CABOT: Anything else?

A STUDENT: Walking might take up his attention so that he would not notice it so much.

DR. CABOT: Possibly.

A STUDENT: Slight obstruction?

DR. CABOT: Yes, very slight. What I have in mind are gas pains either in the stomach or bowel. Insofar as action tends to start the gastro-intestinal tract in motion they are more likely to be relieved by walking than by anything else. But in this case I have no idea that anything will turn out to back that up.

What do we know up to the beginning of the physical examination? We have a man who has epigastric pain with considerable radiation which he has had for five months, which if the history is correct, does not have the type of relation to meals that an ulcer pain does, which has been accompanied by swelling in the groin and the neck, which had been accompanied by constipation. It does not appear that his condition has been in itself bad enough to keep him from work. It is his condition plus the work. These night sweats seem to be the other feature besides the pain—things that you get in a great many diseases, that is ordinary diseases that are accompanied by fever, and by fever that goes up and down a good deal. A steady fever is not so likely to have a sweat in the day or night as the fever with malaria or tuberculosis.

Now the guess in anybody's mind would be likely to be malignant disease of some kind, largely owing to these glands. The pain is of the sort that may go with cancer in the stomach. He is rather young for that, but it can not help being in our minds. He has lost weight, but not so much as you would expect if he had cancer any length of time.

NOTES ON THE PHYSICAL EXAMINATION

"The chest was flat." I suppose it means decreased anteroposterior diameter. It is a very unsatisfactory record. What it means I do not know.

I think that we have no evidence of circulatory disease; it is the sort of cardiac weakness that you get secondary to something else.

We do not know anything about the lungs as yet.

I take it there is no ascites, since it is not stated, and no palpable tumors were found.

"Bean sized cervical, pea sized inguinal glands." It does not help us toward diagnosis, as that is the sort of gland that can be found in anyone.

The blood and urine are essentially negative, I should say.

"A few large mononuclears showed pseudopodia." There is nothing extraordinary about that at all.

The term central achromia is not valuable. All achromia is central. What the term means is a central pallor of the red cells.

"The lung fields were clear." I am glad to get that, because we had such an unsatisfactory account of the lungs before.

They are looking for tuberculosis, because he has a fever and because the cause of that fever is not at all obvious. They have sufficient evidence, I should say, to rule out typhoid. There is no evidence of sepsis, so naturally they are looking hard for tuberculosis, but they are not finding it.

Later they are looking for the most difficult form of gastric cancer to recognize, a cancer on the posterior wall. Any candid X-ray man will tell you that they can miss a cancer there. This X-ray examination apparently is not satisfactory.

The policy of the Syphilis Department here, in accordance with the best departments all over the country, is that if you have positive Wassermanns alone, but no definite history and no definite lesions, you do not make a diagnosis of syphilis. All the more if there is fever, as in this case.

They must have been hard up for a diagnosis to take out so small a gland as he had.

DIFFERENTIAL DIAGNOSIS

I do not know when I have been more completely at sea than I am in this case. Here is a man who has a high continuous fever, and does not show any evidence of the three common causes of that symptom. He has been carefully searched for malignant disease and so far as we know no evidence of it has been found. I should not expect that glands so small would show anything on biopsy. He has been carefully studied from the point of view of syphilis and that has not been found. The most definite physical sign aside from his anemia seems to be the fluid in his abdomen.

Why should not we say he has splenic anemia? I do not know. It is probably as good as any diagnosis I can make. It is unsatisfactory. We do not know much about that disease; large spleen plus anemia equals splenic anemia, which is not very satisfactory knowledge of the disease. Splenic anemia ordinarily shows a larger proportion of reticulated cells than this. The largest proportion that I have seen was in splenic anemia, and this is almost in the normal.

A STUDENT: Is not the general lymphatic enlargement against splenic anemia?

DR. CABOT: Not the amount he has.

A STUDENT: How do you rule out subacute bacterial endocarditis?

DR. CABOT: How can you possibly rule it in when we have nothing but the fever? We have nothing in the heart. We have negative blood cultures. There is no evidence of embolism, no leucocytosis, and it is presumably the same disease that he has had for five months. A process of that kind that has gone on for five months shows something in the heart. I do not believe

that this patient has it, but it is always possible. We can never rule it out and feel safe.

A STUDENT: Why didn't they transfuse him?

DR. CABOT: I do not know.

A STUDENT: Does miliary tuberculosis last as long as that?

DR. CABOT: Not so far as I know. We had a good X-ray, and certainly if a miliary tuberculosis had been going on all this time the lesions would have been large enough to show in X-ray. They sometimes show in much less time than this.

A STUDENT: Aleukemic leukemia?

DR. CABOT: I do not know anything about that disease except as it is produced by radiation. It is a favorite diagnosis. This man, as far as we know, has had no X-ray treatment.

A STUDENT: Would you consider the abdominal type of Hodgkin's disease?

DR. CABOT: Hodgkin's is not characteristic in the blood ever, and therefore this blood will do. Hodgkin's often shows an anemia, and this case does. It has fever and this has fever. It often has a large spleen, and this case has a large spleen. The chief difficulty is that we do not know why he died. In Hodgkin's disease they ordinarily die of cachexia, or of an intercurrent infection and a much more extreme anemia. We do not know what the red count was in the end. The last count recorded here is three million.

MISS PAINTER: The final count was 1,320,000.

DR. CABOT: Then that is all right for a death either from Hodgkin's or splenic anemia.

A STUDENT: How about tuberculous peritonitis?

DR. CABOT: That does not produce such an anemia. In the second place he did not have fluid except at the end. In recognizable tuberculous peritonitis there is fluid from the beginning ordinarily.

I think we have a right to know the result of the biopsy of these glands. I predict it will be negative.

PATHOLOGICAL REPORT

A peanut-sized node from the neck with a white, glistening surface on section. A microscopic examination shows a structure of atypical cells of the lymphocyte series with many giant cells. There is an abundant fibrous stroma which has undergone hyalin degeneration.

Malignant lymphoma.

REPORT FROM ANOTHER BOSTON HOSPITAL

On September 22 (three weeks before admission to the Massachusetts General Hospital) an inguinal gland was removed for biopsy. Microscopical examination showed a tendency to increase in fibrous tissue and leucocytes. No mitoses were found. Diagnosis, chronic inflammation.

On September 28 a gland was removed from the right side of the neck. Microscopical exam-

ination showed numerous large pale cells consisting of an oval nucleus in which were a few clumps of chromatin and an indistinct cytoplasm. Many of these cells showed mitoses. There were numerous lymphoblasts and fewer lymphocytes. The connective tissue stroma was scanty. Diagnosis, Hodgkin's disease.

CLINICAL DIAGNOSIS (FROM HOSPITAL RECORD)

Malignant lymphoma.
Syphilis.
Secondary anemia.

DR. RICHARD C. CABOT'S DIAGNOSIS

Splenic anemia?

ANATOMIC DIAGNOSES

1. *Primary fatal lesion.*

Lymphoblastoma of spleen, liver, lymph nodes and bone-marrow.

2. *Secondary or terminal lesions.*

Bronchopneumonia.
Syphilis of aorta.

3. *Historical landmarks.*

Fibrous pleuritis.

DR. MALLORY: It was by no means the typical picture of lymphoblastoma. There was more or less general enlargement of the lymph nodes, but not to very great dimensions, and the bronchial glands, which we generally count on being enlarged in this condition, were very slightly enlarged. Only two of them were definitely tumorous.

There was a slight degree of terminal bronchopneumonia.

The heart was negative. The aorta did show a fairly definite syphilis.

The liver weighed a little over 2000 grams. It was very pale. The cut surface showed the centers of the lobules pale, with a surrounding rim which was reddish brown in color. Scattered throughout the liver were many pin-head to cherry-sized, sharply circumscribed yellow nodules which were irregular in outline. The center of a good many of the larger ones was soft and necrotic. So far as that description goes, and you can see from the liver itself, it would be difficult to be certain that it was not a carcinoma with metastases. However, the spleen weighed 1020 grams, was very soft, the corpuscles were prominent, and there were a great many little yellow nodules scattered over it, which makes the diagnosis, even in gross, fairly certain that you are dealing with a lymphoblastoma and not with metastatic carcinoma. Metastases of other tumors to the spleen do occur, but they are relatively rare. The gross appearance of these spleens is rather typical. If any of you have ever been to Paris you have

perhaps seen what they call *boeuf à la mode*. They take a large piece of beef and punch holes in it. Then they take strips of fat and push them through the holes. It gives almost the same appearance as these Hodgkin's disease spleens.

Microscopic examination showed in the liver infiltration with a very scirrhous tumor which was composed of atypical cells of the lymphocyte series, some of them multinucleated. There was a great deal of necrosis in the tumor itself and in the surrounding liver tissue. There was practically no eosinophilia, which one would expect in a typical Hodgkin's. The spleen showed similar nodules.

The bone marrow showed infiltration with tumor, and in view of the blood picture that is interesting, because there were numerous large phagocytes in it which had ingested red cells.

DR. CABOT: There is no doubt in your mind as to the diagnosis?

DR. MALLORY: No, sir. It is not an absolutely typical picture, but is quite sufficient for a diagnosis.

CASE 13382

SORE MOUTH AND DIARRHEA

MEDICAL DEPARTMENT

A discouraged, broken-down American farmer's wife forty-five years old came to the Emergency Ward January 12 complaining chiefly of cankers in the mouth.

She gave a history of an illness of undetermined duration. During the past two years there were two distinct peaks when she had redness and peeling of the backs of the hands, cankers in the mouth, diarrhea, pain low in the back, burning and pain on micturition, dullness of vision, numbness of the extremities and general weakness and debility. The first of these periods was at the time of an operation on her gall-bladder two years before admission and lasted about two months. At that time her tongue was dry, red and swollen. She had diarrhea with movements three or four times a day and tenesmus. She later recovered from all these symptoms. For two years she had had dullness of vision continually in the morning and evening. For a year she had had constant and increasing discomfort from itching and smarting of the vulva. There had been a little foul discharge. For the past few months she had been very weak and subject to attacks of nausea once or twice a week lasting one or two days. These usually followed meals, but sometimes began in the night or morning. At times she vomited "bile" with these attacks. She always had headache and felt exhausted. A week before admission she had "heaviness" and numbness of the hands and feet for four days. For the past four days she had had cankers in

her mouth, dry, very red and swollen tongue, and had raised considerable phlegm, she believed from her stomach. She had had constant dull bearing-down pain low down across the middle of her back, made worse by standing and relieved by sitting down. During the past two days it had been difficult for her to eat because of a feeling of pressure and "filling up" beneath her sternum. Though she seemed depressed her mental condition was apparently normal.

Records of the Out-Patient Department show a visit November 4, seven years before admission. The chief complaint then was stomach trouble for several weeks, nausea after eating, severe headache and vomiting. She felt weak and tired. The year before she had had an operation and had never regained her strength. Examination was negative except for pale mucous membranes, a very faint systolic murmur at the third left space and a median abdominal scar well healed. Nothing was found to account for her symptoms except constipation. A month later she was beginning to feel better.

She had had the diseases of childhood and grippé. From the age of fourteen to forty-four she had mild "bilious" headaches on top of her head accompanied by vomiting "bile." She had used headache tablets and a tonic for a long time. Eight years before admission, after twenty years of backache, tired feeling and headaches, she had an operation at which one tube was taken out. This temporarily relieved the symptoms. Beginning four years ago she was jaundiced for two years. Two years ago she had another operation at which a very large bile-filled gall-bladder and her appendix were removed. She had about one cold a year. At twenty-four years she weighed 125 pounds, her best weight; her usual weight was 115 pounds.

Clinical examination showed what appeared to be a completely broken-down old woman, toothless, very thin, with sallow skin, very faint voice and a woebegone expression. The skin showed undefined red, somewhat tender macular patches over both elbows. The skin over the breasts, which were very loose, resembled crêpe paper. There was a pigmented mole between the scapulae. The abdomen showed two brown pigmented scars, one in the epigastrium and one in the hypogastrium. No abnormalities of the heart, lungs, abdomen or pupils are recorded. No vaginal or rectal examination is recorded. The knee jerks were normal, the ankle jerks not obtained. When the covering of gray ointment was removed from the hands they showed well defined dark red coloration extending from the terminal joints of the fingers over the backs of the hands to the wrists, where the borders were V-shaped, the apex pointing toward the fingers. There was some scaling and desquamation. The finger-tips seemed to wear white thimbles of normal skin. Between the

fingers were deeply eroded areas. There were some erosions on the back of the right hand. The upper teeth were all gone. The throat was inflamed.

The amount of urine is not recorded, specific gravity 1.025, a slight trace of albumin at the single examination, sediment loaded with red and white blood cells. *Blood:* 10,100 leucocytes, 70 per cent. polynuclears, hemoglobin 75 per cent., reds normal. Stools, guaiac negative, no gross blood. Wassermann not recorded.

Temperature 98.4° to 102°, pulse 78 to 135, respiration normal.

The patient was treated locally by zinc oxide paste to the hands, a gargle for the mouth, a wash and zinc oxide paste with menthol for the genitalia. Fluids were forced. The diarrhea continued, but there was relief to the genitalia and mouth. She did not eat well. January 15 she was given 2800 calories a day with a high caloric mixture. This she took fairly well. The morning of January 17 she seemed to have improved locally, but her general condition did not seem good. She took her food, however, with persuasion, and in the afternoon gargled without apparent difficulty. At five o'clock her temperature was 102° by rectum. The heart sounds were barely perceptible, the pulse not palpable, and she looked very ill. 700 centimeters of 10 per cent. glucose was given intravenously, and one ampule of cardiazol. After this she became somewhat delirious and talkative and looked better. The pulse was palpable, but the blood pressure was not obtainable. Soon after this she saw some visitors. She again began to look ill. Another ampule of cardiazol was given. After this she died.

DISCUSSION

BY RICHARD C. CABOT, M.D.

NOTES ON THE HISTORY

It seems to me an interesting fact that the chief complaint was cankers of the mouth, as this patient entered five days before her death. At that time her general knowledge of her own illness was cankers in the mouth.

After reading that second sentence in the history of the present illness I think the man who took the history undoubtedly was thinking of two things. What should you say they probably were?

A STUDENT: Pernicious anemia.

DR. CABOT: What else?

A STUDENT: Pellagra.

DR. CABOT: My guess is that those were the two things in his mind at this stage. The redness and peeling of the hands, along with the mouth symptoms and the gastro-intestinal symptoms, naturally make you think of pellagra.

A STUDENT: Do you see a similar picture in sprue?

DR. CABOT: Sprue is rather a mythical disease to me. We have never had a case here that we know of. I think there are people who doubt whether there is such a disease. I have nothing to say on the subject.

Of course we do not know that she had anything the matter with her gall-bladder.

I do not know whether the operation mentioned in the Out-Patient history is the same operation mentioned in the past history, but I suppose not.

After reading the history I am still absolutely in the dark.

NOTES ON THE PHYSICAL EXAMINATION

The knee-jerks are the first definite physical sign that we have. But I cannot imagine how they can have anything important to do with this case.

No doubt they are thinking of pellagra. I wish I knew a little more about that disease. I know practically nothing about it, having seen it only by reading and in one or two cases in this hospital.

Cardiazol is a German proprietary preparation, a pentamethylentetrazol, similar in its effects to camphor, but with the advantages of being tasteless, odorless, and much more rapid in its action than camphor.

DIFFERENTIAL DIAGNOSIS

I do not know the diagnosis of this case. The only facts that we have are those lesions about the hands and the diarrhea, both of which are symptoms of pellagra. She must I think have had some complication, presumably an infectious terminal complication; but there is nothing I see to indicate what it is. I should like to ask one preliminary question. Suppose this was pellagra, could the pathologist find it out at necropsy?

DR. TRACY B. MALLORY: We should have no better chance than the dermatologist in life. It is the distribution of the dermatological lesions that is the only morphologic criterion.

This was stated to be entirely typical by the dermatologists. The salient characteristic was its symmetry. It stopped at exactly the same point on each wrist.

DR. CABOT: Can it be seen well after death?

DR. MALLORY: Yes.

DR. CABOT: Was there any evidence of it anywhere else?

DR. MALLORY: No.

DR. CABOT: It did not go up the forearms?

DR. MALLORY: No; just a little above the carpal bones.

DR. CABOT: As I said, I always am very sorry that you have to make a diagnosis that we have no considerable clinical experience of. But largely for the want of any better diagnosis I think I should have been forced to say, "If it is not pellagra I do not know what it is."

Let us think of some of the possibilities. Can it be a simple chronic ulcerative enteritis, the kind we see not infrequently without any hint as to cause pursuing a fatal course? If so we ought to have something more in the stools. We cannot make that diagnosis unless we have pus and blood.

MISS PAINTER: Guaiac was positive at one of two stool examinations. There was no pus.

DR. CABOT: We have no evidence of an ulcerative process in the intestines such as could cause death.

Here is a chronic disease in an emaciated woman. Three things come to one's mind, tuberculosis, syphilis and malignant disease. I do not see that we have anything to back up any of them. The examination of the lungs seems to be negative. There is nothing in the glands or bones. I do not see how we can say tuberculosis. If she had malignant disease there would have been more pain, something to localize it in some part of the body. There is no reason to suppose syphilis. The Wassermann is not recorded.

Could she have had diabetes? I do not believe so. We have only a single specimen of urine which gives no support to that diagnosis. They did not try for blood sugar. I see no reason why they should have tried it.

Could she have had a chronic nephritis? I do not see how she could. There is no reason to suppose that the heart is enlarged. Is there any blood pressure measurement?

MISS PAINTER: It is not recorded.

DR. CABOT: I can go no further.

A STUDENT: Is there any indication of infection in the genito-urinary tract?

DR. CABOT: I think not. I do not believe that Dr. Mallory will confirm any local process in the genitalia. Of course I am not certain there was no terminal infection. If there was, the lungs are as good a place as any.

A STUDENT: What was the real cause of death?

DR. CABOT: I think I should put down pellagra as the underlying cause. I should say also some terminal infection. I cannot say any more. I do not feel sure even of that.

A STUDENT: When you read the slight trace of albumin in the urine, did you take it for granted that it was taken by catheter?

DR. CABOT: No; I took it for granted that it was not. Therefore I disregarded the finding. We have no evidence that it was a catheter specimen, have we?

MISS PAINTER: No.

DR. CABOT: I assume that the albumin is part of the vaginal discharge.

CLINICAL DIAGNOSIS (FROM HOSPITAL RECORD)

Pellagra.

DR. RICHARD C. CABOT'S DIAGNOSIS

Pellagra.

ANATOMIC DIAGNOSES

1. *Primary fatal lesion.*

Pellagra.

2. *Secondary or terminal lesions.*

Pulmonary embolus.

Pulmonary infarct.

Edema of the brain.

3. *Historical landmarks.*

Diverticulum of the small intestine.

Cholecystectomy, old.

DR. MALLORY: As I said before, the skin lesions were apparently very typical of pellagra. Dr. Charles J. White, who is about the only person near here who has seen very much of that, felt quite confident about it; and I do not think we should question his diagnosis at all. As to the possible etiology, we were not able to get very much that was definite on that point. The disease is very rare in this part of the country, and is presumably a matter of some dietary insufficiency. The internes went into the question of diet to some extent with her. About all they could find was that, on account of these rather vague symptoms of indigestion which she had had for a period of years, she had developed the habit of eating very little most of the time. She went along for one or two weeks with very little but crackers and milk, then ate a big meal of meat. Then she would starve herself for another period. Possibly that is the explanation.

As to the immediate cause of death, it was something entirely unexpected. She had an old lung infarct, with a small thrombus in an artery in the immediate vicinity of that. In the pulmonary vein was a large embolus which obstructed both branches of the pulmonary artery. We did not find the source of the embolus. It was not within the abdomen, and we were restricted to that region.

The heart was extremely small, weighing only 190 grams.

The other organs were all essentially negative. Her gall-bladder had been removed. Her tubes were both present and tightly adherent to the uterus with old adhesions.

The brain was very edematous.

DR. CABOT: As long as this seems to be pellagra, I wish you would describe in detail the condition you found in the hands, because I know so little about it.

DR. MALLORY: I am afraid I cannot give a very good description of it. I did not do the necropsy. I will read Dr. Justice's account of it. "On the backs of both hands the skin is thick and waxy, and there is apparently an increase in pigment underneath. There is a mod-

erate degree of scaling, and the folds between the fingers are deeply cracked." The lesions extended to just above the tip of the ulna on both wrists, absolutely symmetrical. They were quite dark, brown rather than red, after death. That is about as much as we could make out of it. The dermatologist's report in the clinical record gives a better description.

CASES OF DIPHThERIA, SCARLET FEVER AND INFANTILE PARALYSIS SHOWN TO BE GAINING IN FORTY-FOUR STATES

DIPHThERIA, scarlet fever and infantile paralysis were the communicable diseases most prevalent in the United States during the week of August 6 of this year, as compared with the corresponding week of 1926, according to reports reaching the United States Public Health Service from State health officers, made public August 26.

Forty-four states reported 199 cases of poliomyelitis, (infantile paralysis) for the current surveyed week as against 69 reported by the same states during the week ended August 7, 1926.—*U. S. Daily.*

ABOLITION IS SOUGHT OF "DIPLOMA MILLS"

LEGISLATION to abolish what he terms "diploma mills" in the District of Columbia will be sought by Senator Copeland (Dem.) of New York at the next session of Congress, the Senator announced orally on August 9.

At the same time the Senator made public the text of the bill which he will introduce to carry out his plan, together with the text of another bill, designed to prevent similar institutions in the various States from using the mails to carry on their activities.

The bills, the Senator said, are to be practically identical with those which he introduced several years ago during the 68th Congress.—*U. S. Daily.*

APPROVED LABORATORIES IN CONNECTICUT

Six additional bacteriological laboratories have been approved by the State Department of Health since June, 1927, in accordance with Regulation 40 of the Sanitary Code of Connecticut:

The Griffin Hospital Laboratory, Derby, under the direction of Charles J. Bartlett, M.D.

Manchester Memorial Hospital Laboratory, Manchester, under the direction of Ralph E. Kendall, M.D.

Hall-Wilson Laboratory at Hartford Hospital under the direction of Wilmar M. Allen, M.D.

W. W. Backus Hospital Laboratory, Norwich, under direction of John A. Ferguson, M.D.

Stamford Hospital Laboratory, Stamford, under the direction of Bruce S. Weaver, M.D.

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MACFADDEN, PROPHET OF HEALTH

FROM his pinnacle of success—for successful he undoubtedly is—Bernarr Macfadden stretches a propitiatory and patronizing hand to the doctor. As he somewhat awkwardly expresses it, "We have a friendly attitude toward everyone of them if they are honest and attempt to do the best they can within the limits of their sphere." In order to crystallize into some definite form the spirit of coöperation which should exist between physical culture and the medical profession, the president of the Macfadden Publications, Inc., has written to a number of doctors a very suave and conciliatory letter, asking them to indicate their approval of physical culture methods by "signing the enclosed post-card."

With a portion of Macfadden's teachings the medical profession is most heartily in agreement. The Physical Culture Creed, for example, can be endorsed in its entirety. Overeating and physical stagnation are so manifestly bad that no one will want to defend them. Macfadden, like any other trainer of bodies, reverences hygiene and knows how to make fit the ill-conditioned. He has succeeded in interesting

enough people in his publications to build up a highly successful publishing business, although how much of his success is due to interest in health and how much to the obvious sex note of much of his material is uncertain. At any rate, having reaped a large reward for his enterprise, he now imagines that his opinions on matters of which he really knows nothing are worthy of notice. He is opposed to the use of drugs. What does he know of the action of morphia, of digitalis, of insulin? He believes in the treatment of syphilis by milk! He is opposed to the use of all sorts of vaccination and inoculation. Has he ever taken the trouble to study the facts in regard to the control of smallpox and typhoid fever by these measures?

Nothing illustrates Macfadden's fanaticism better than the following paragraph from his editorial in *Physical Culture* for June, 1927:—

"And the commercial side of the doctoring business often begins to work higher up. The men who pull wires to scare people into being vaccinated and adopt other medical measures through fake epidemics—they are the real criminals. They are traitors. Health and life mean but little to them. It is criminals of this sort that this publication is arrayed against to the very last degree. And it is our purpose to fight in the interest of the people against such enemies to the very end."

This from the man who does "not want to be caustically critical in dealing with a doctor." His self-importance, his effrontery, are magnificent. We regret that we cannot endorse his work, for there is good in it. But the good is lost in a mass of vague, illogical beliefs, crudely presented and appealing to the type of man who thinks that because an idea sounds reasonable to him, his opinion on it is as good as that of one who has real knowledge of the facts. To lead people into accepting false ideas is bad enough, but the encouragement of the antivaccination idea is distinctly harmful. We regret to say that we consider Macfadden, who spreads pernicious doctrines under the veneer of hygiene, a menace to the public health and we refuse to sign his post-card.

SPECIALIZATION IN RESEARCH

As the field of knowledge becomes wider and wider, naturally the workers on the frontier become more separated from one another until they hardly realize what is going on in other fields than that of their own chosen endeavor. The meetings of our scientific societies, and the various abstract journals, such as the *Biological Abstracts*, are doing their best to keep research workers in touch with one another at least to a slight extent. However, only too often scientists must feel that the Bible admonition to "let not thy right hand know what thy left hand doeth" is being carried too far by its followers.

The biochemists, wandering in a maze of hydrogen ion concentration and structural formulae, have a pretty clear idea of what their physiological neighbors are doing with the Donnan equilibrium or osmotic pressures, but have little or no knowledge or interest in what their distant cousins, the cytologists, may be doing with chromosomes or mitochondria. It is unfortunate that the great extent of detailed knowledge of the present day has rendered it impossible for a man to keep in touch with the advancements of all fields without neglecting the detailed work in his own chosen field of endeavor.

However, it is becoming more and more apparent that the advice of the circus hanger-on to the country boy is sound, "Ride two horses and everybody will look at you, ride one and they won't know you are around." A man who can ride two sciences or even more is the man who will at least lead the way to discoveries if not actually make them. As Claude Bernard says, "Parceling out the experimental domain is useful because each one of the various parts is all the better cultured, but it goes ahead only by the union of all parts of the method converging toward a common goal." It is obvious that endless accumulation of observations leads nowhere. In the same way, hypotheses unverified or incapable of being verified by experiment would lead us back to the dark ages and the maze of Scholasticism.

Most important of all, however, is the recognition that those individuals capable of generalizing and systematizing their knowledge can do well only to that extent to which they are familiar with the general aspects of the different fields of knowledge, and a sufficiently detailed acquaintance with the experimental methods to properly evaluate the mass of facts before them for digestion. The day may come when, in addition to specialists in every line,—physicists, pathologists, bio-chemists, physiologists, bacteriologists, serologists, and all the narrow subdivisions of these—we may have to introduce the specialists, who, like the bee which selects the honey from many different types of flowers and concentrates it into accessible form, can dip into the various fields of knowledge and bring out for our use, coördinated and concentrated knowledge.

MATERNAL DIET AND HEMORRHAGE OF THE NEW-BORN

The tendency to hemorrhage shown by newly born babies has been known to exist in varying degrees and apparently distinct from the true entity of hemorrhagic disease of the new-born, and has proven one of the problems of pediatrics. Trauma and syphilis have been suspected as etiological factors, but frequently are not found at autopsy. In the light of our present belief that intracranial hemorrhages occur far more frequently than had been previously suspected, any

information which will help to clear up this question will be of extreme value.

C. Ulysses Moore and J. L. Brodie have recently presented the results of certain observations which, if confirmed, may go far towards elucidating this problem (*Am. J. Dis. of Child.*, 34:53, July 1927). A number of laboratory rats, on a diet deficient in anti-neuritic vitamin B, have been observed to suffer from severe and sometimes fatal hemorrhages during parturition, although the female rat normally delivers her young without visible loss of blood. The penalty of this abnormal diet, furthermore, extends to the young of these mothers, for with them one of three conditions may result: (1) abortions or absorption of the embryos, (2) death of the young at birth or (3) death during the nursing period. The deaths occurring at birth or soon after are characterized by hemorrhages; some of those occurring later show in addition marked emaciation, gastric stasis and myelin degeneration of the vagus and phrenic nerves. An increase of vitamin B in the maternal diet practically eliminates both hemorrhage and paralysis; the addition of vitamin C without the addition of vitamin B was of no value in preventing them.

One human child delivered by a mother who had been living on a diet deficient in water-soluble vitamins came to autopsy. The mother had suffered from a severe hemorrhage during parturition and the infant, which died on the fifth day, had shown hematuria and clinical signs of anemia. At autopsy blood was found in the abdominal cavity, emanating from ruptured subcapsular hemorrhages of the right kidney and right suprarenal and patches of hemorrhage were found on the bladder mucosa. A number of nerves from the lumbar plexus showed myelin degeneration, typical of beriberi.

No definite proof that beriberi is a common cause of hemorrhage in the new-born is contained in this report, but knowing how maternal diets during pregnancy may be restricted by choice, by pernicious vomiting and the like, the evidence presented is of great interest and should stimulate further investigation.

THIS WEEK'S ISSUE

CONTAINS articles by the following named authors:

BARNETT, C. W. M.D. Harvard Medical School 1927, Interne Lane Hospital, San Francisco, Calif. His subject is: "Tobacco Smoking as a Factor in the Production of Peptic Ulcer and Gastric Neurosis." Page 457. Address: Lane Hospital, San Francisco, Calif.

CHEPLIN, H. A. B.S., Ph.D. Yale University, 1921, Associate Professor of Bacteriology at Syracuse University. His subject is: "Further Studies on the Clinical Value of *B. Acidophilus* Milk with Special Reference to the Basis of Selection of *B. Acidophilus* Strains for Thera-

peutic Purposes." Page 460. Address: 17 Lyman Hall, Syracuse University, Syracuse, N. Y.

BEARSE, CARL. M.D. Tufts College Medical School 1915, and Army Medical School, Washington, D. C., 1918, Assistant Visiting Surgeon to the Beth Israel Hospital. His subject is: "Strangulated Hernia in the Aged." Page 471. Address: 483 Beacon St., Boston.

THORNDIKE, TOWNSEND W. M.D. Harvard Medical School 1902, Physician-in-Chief for Diseases of the Skin and Syphilis, Boston City Hospital, Professor of Dermatology at Tufts College Medical School, Consultant to the Marine Hospital, Chelsea, United States Public Health Service. His subject is: "A History of Bleeding and Leeching." Page 473. Address: 75 Fresh Pond Parkway, Cambridge, Mass.

MISCELLANY

PREVALENCE OF PELLAGRA IN LOWER MISSISSIPPI VALLEY DUE LARGELY TO ECONOMIC CONDITIONS AND COTTON PRICES

Economic conditions have a direct effect on the prevalence of pellagra in the lower Mississippi river valley, the Public Health Service has just announced as a result of a survey in the districts recently flooded. The price of cotton is the chief economic factor, it was said.

The Public Health Service report on increased prevalence of the disease, following the floods, and its recommendations to check the spread of the ailment were printed in the issue of August 26. The section of the report dealing with economic factors in influencing prevalence follows in full text:

With respect to the economic factors related to the prevalence of pellagra in the area under consideration, we made inquiries of physicians, health officers, tenants, planters, business and professional men; of farm demonstration agents, county officials and others in the localities visited.

Without attempting to report in detail the statements made and the opinions expressed by the various individuals, the information so obtained is summarized in the following four paragraphs:

1. The prevalence of pellagra at any given time in the lower Mississippi River area is involved in three sets of conditions, namely:

(a) The dietary habits of the inhabitants;

(b) The tenant farm system of cotton production, cotton being the chief crop throughout the low lands along the lower Mississippi and tributary rivers;

(c) The availability of supplies of various foods which, in turn, is influenced by the one-crop type of agriculture with the consequent lack of diversification and by the dietary habits of the people.—*U. S. Daily.*

ACTIVITIES OF MEDICAL SERVICE EXPANDED BY VETERANS' BUREAU

THE Veterans' Bureau maintains fifty hospitals in all parts of the country. When there is no bed space available in these hospitals veteran beneficiaries may be placed in Public Health Service, Army, Navy, or Interior Department hospitals.

ORDER ESTABLISHES MEDICAL SERVICE

The full text of the General Order follows:

The following General Order is hereby promulgated, effective September 12, 1927, for observance by all officers and employees of the Veterans' Bureau:

1. There is hereby established in the Veterans' Bureau a medical service under a Medical Director who will be responsible to the Director for the proper conduct of the activities under his charge.

2. These activities will include the following:

(a) Initiation of policy and procedure in all medical, including dental, matters, and of field instructions and correspondence defining and applying approved medical and dental policy and procedure.

(b) Directions and supervision of all medical activities in central office and the field, excepting those of medical employees engaged in the activities for which the adjudication service and the advisory group on appeals are responsible, which exception will include those functioning as medical members of rating boards and appellate bodies; and including physical examinations of and medical care and treatment for out-patients through regional medical activities and by designated physicians and dentists; operation of follow-up nurses and social workers; fabrication, fitting, and supply of orthopedic and prosthetic appliances; and facilities of veterans' hospitals and contract institutions.

(c) Collaboration with the adjudication service in revisions of the schedule and disability ratings; rendering of opinions on medical questions.

(d) Instructions of personnel engaged in medical activities through Bureau issues and courses conducted in Bureau stations; detail of professional (medical) personnel to courses of training in medical schools or clinics approved by the Director.

ORGANIZATION PLAN IS OUTLINED

3. The organization of the medical service will consist of these:

Divisions, Regional Office, General Medical, Tuberculosis, and Neuropsychiatric;

Subdivisions, Insular and Foreign, Dental, Prosthetics, Medical Research, Occupational and Physiotherapy, and Business Management;

Sections, Nursing, Dietetics, Social Work, and Library.

The subdivisions and sections listed are independent of any of the four divisions named above and, with the exception of the medical research subdivision which is responsible directly to the Medical Director, are responsible to the medical director through the Executive Officer of the medical service.

4. The regional office division will exercise supervision over the medical organization and the methods of all regional medical activities, determine need of medical professional and sub-professional personnel and medical supplies requisitioned by regional offices; and maintain a high standard of uniformity in the provision of medical attention provided through regional medical activities and contract hospital.

SUPERVISORY DUTIES OF MEDICAL DIVISION

5. The general medical division will exercise direction and supervision over those hospitals of the Veterans' Bureau which are equipped primarily for general medical and surgical patients. It will determine need for personnel and supplies requisitioned for such hospitals. It will advise in the formulation of programs of hospital construction or alteration, in co-operation with the Construction Division; will construct charts of organization for general hospitals, and will maintain uniformity in approved methods and organization in the general hospitals of the Veterans' Bureau.

6. The tuberculosis and neuropsychiatric divisions will have the same duties as the General Medical Division, in connection with those Veterans' hospital devoted to tuberculosis and neuropsychiatric beneficiaries.

7. The insular and foreign subdivision will exercise supervision over the physical examination and medical treatment of Bureau beneficiaries in the territories and insular possessions of the United States and in foreign countries, as well as supervision over the same services to ex-service persons of allied nations residents in the Continental United States or in its territories and insular possessions, in accordance with authorities of the Governments concerned. This subdivision will also supervise guardianship matters related to beneficiaries under its jurisdiction, in the manner provided for in General Order No. 360.

8. The dental subdivision will exercise supervision over dental activities in regional territories and in United States veterans' hospitals.

9. The prosthetics subdivision will exercise supervision over Bureau orthopedic workshops, will authorize special orthopedic or prosthetic appliances, and will maintain a record of all such appliances issued beneficiaries in the field.

RESEARCH TO BE CONDUCTED ALONG MEDICAL LINES

10. The medical research subdivision will conduct research along medical lines intended to improve the character of the medical service

rendered beneficiaries and effect proper economies in such relief.

11. The occupational and physiotherapy subdivision will exercise supervision over physiotherapy and occupational therapy given beneficiaries in field stations and contract hospitals, as well as over agricultural activities of an occupational therapy character at United States veterans' hospitals.

12. The business management subdivision will operate in accordance with the provisions of General Order No. 342, and through co-operation with the supply service, finance service, co-ordination service, and construction division.

13. The nursing section will exercise supervision over all nursing activities in veterans' hospitals and cover follow-up nursing in regional offices.

14. The dietetics section will exercise supervision over all dietetics activities in veterans' hospitals.

15. The social work section will exercise supervision over all social workers and their activities in veterans' hospitals and regional offices.

16. The library section will exercise supervision over the activities of librarians in veterans' hospitals, and over the supply of reading material for patients in those hospitals.

General orders No. 246, 246-A and 267 and all other general orders, circulars and bulletins in conflict herewith are hereby modified.

There are about twenty-five thousand Veterans of Wars hospitalized in Veterans' Bureau and other Government Hospitals.—*U. S. Daily.*

A REVIEW OF PREVENTIVE VACCINATION AGAINST TUBERCULOSIS WITH CALMETTE'S VACCINE B.C.G.*

BY B. M. FRIED, M.D.

THE history of tuberculosis is lacking in dramatic events since the discoveries made by Koch and Pirquet. The antituberculosis movement of the last few decades has been based exclusively on the principles formulated by these two masters. This holds true not only of the social crusade against tuberculosis but also of scientific laboratory research. All the theories concerning primary and secondary infection with the tubercle bacillus—allergy, anergy, etc., are but repercussions of the "Koch phenomenon" and the "Pirquet tuberculin test." The fundamental principles of the discovery of Calmette—the subject of the present communication—is also but a practical application of the experiments of the scientists named.

Koch noted that when virulent tubercle bacilli are injected subcutaneously into a guinea pig there occurs not only a generalized distribution throughout the system, but also there forms at the point of inoculation a local ulcer (chancre of inoculation) which persists until the animal's death. But when a certain number of bacilli

*Read at a meeting of the Greater Boston Medical Society, November 2, 1926.

are introduced into an animal already infected with Koch's bacillus, the ulcer which appears at the site of infection heals within a short period of time. The animal, of course, perishes from its first infection. This observation known as "Koch's phenomenon" has been the object of multiple investigations and lies as a corner stone in the problems of tuberculosis for future generations. The significance of this phenomenon was recently formulated by Allen K. Krause and H. S. Willis as follows: "There is every reason to believe that ten or fewer virulent tubercle bacilli placed aright will lead to progressive tuberculosis in the normal guinea pig. A tuberculous, and, therefore immune, guinea pig will for months hold in check ten thousand times ten bacilli, and more, when these are introduced from without. The immunity of tuberculosis to a single reinfection from without may be *relative* as it is frequently called, but it is amazingly high."

The last three decades abound with reports concerning vaccinations against tuberculosis. Inspired by the "Koch phenomenon" and the methods of Pasteur, workers in different countries attempted to vaccinate against phthisis by the use of different substances such as tuberculin or other extracts from killed tubercle bacilli, and also virulent or attenuated tubercle bacilli.

These experiments, although unsuccessful, have nevertheless shown that the idea of anti-tuberculosis vaccination is not in itself Utopian. Moreover, it was evident that by the use of a *living* but properly attenuated strain of tubercle bacilli a state of resistance to new infections with tuberculosis from outside can be induced with certainty in animals.

It will be remembered that one of the known essential differences between the immunity to the tubercle bacillus and that of other pathogenic bacteria lies in the fact that the immunity to the common microorganisms can be created by the administration of extracts prepared from the germ or by the germ itself killed by chemical or physical means, whereas in tuberculosis the immunity to the Koch's bacillus exists as long as there is a state of "parasitism between the germ and the host," which is usually disclosed by the tuberculin test.

In 1904 Kraus showed that bile attenuates the virulence of the virus of rabies, and Neufeld has demonstrated the lytic action of bile upon the pneumococcus. Calmette and Guérin at the same time conceived the idea to cultivate the bovine tubercle bacillus on the customary potato-glycerin medium to which they added 5 per cent. of ox bile. The cultures were transplanted every 25 days. After 230 transplantations in this medium, which took 13 years, the bacillus so treated was shown to be deprived of its pathogenicity toward experimental animals. The sensitiveness of the guinea pig to infection with Koch's bacillus is widely known. As noted

above a few tubercle bacilli injected into the peritoneum, into the veins, or subcutaneously into this animal lead invariably to a fatal tuberculosis. But the animal reacts altogether differently toward the bile treated bacillus, or the B.C.G. (Bacillus-Calmette-Guérin). Thus, the abscess at the site of inoculation (chance of inoculation) is insignificant and the tributary lymph nodes are but very slightly enlarged. The microscopic lesion produced by the B.C.G. although resembling a "miliary tubercle" (epithelioid cells surrounded by lymphoid cells) differs however from the latter in that it shows no central caseation—which is an essential feature of the lesion produced by a virulent Koch's bacillus. Then again the produced lesion regresses ending in complete disappearance of the tissue reaction, that is to say, there occurs a complete cure without scar formation; and finally tissue from animals infected with B.C.G. when injected into healthy ones fails to reproduce the disease.

Criticism was advanced to the effect that the apparently "innocent" acid fast B.C.G. may "reclaim" its pathogenicity after it has remained in the human body for a certain length of time. The experiments of Pasteur, for instance, have shown that a very attenuated anthrax vaccine which is harmless to a young mouse becomes so virulent as to kill a bull after it has passed gradually through certain animals. Calmette does not believe, however, that such is the case. His opinion is to the effect that years of transplantation in the bile medium have very deeply modified the tubercle bacillus. He regards, therefore, the possibility of the bile treated bacillus to regain its former pathogenicity as very slight. Moreover by keeping the B.C.G. under the skin of an ox for one year, he did not notice any change in the virulence of this bacillus, although it remained alive. Experiments by other workers along the same line are in accord with those of Calmette. Thus Calmette has obtained a tubercle bacillus whose properties have been shown to be unchangeably transmitted from generation to generation, in other words the B.C.G. may be considered as a "virus fixe"—a term introduced by Pasteur concerning the virus of rabies whose biologic properties are *fixed* forever.

Although, paradoxical as it may appear, the B.C.G. does not produce the characteristic histologic lesion and accordingly does not lead to phthisis, it has retained its antigenic properties. Animals or human beings treated with this germ respond by an abundant formation of antibodies disclosed in their serum by the complement fixation reaction. It also has retained its ability to produce a powerful tuberculin.

The first vaccination experiments with the B.C.G. were effected by Calmette and Guérin on laboratory animals, on young cattle and on anthropoid monkeys. A careful observation of these animals for a reasonably long period of

time showed the French workers that "a true immunity against natural or artificial contact with tuberculosis can be conferred to young animals (including monkeys) free from preexisting tuberculosis."

The freedom from preexisting tuberculosis is a *conditio sine qua non* in Calmette technique of vaccination. The introduction of the B.C.G. in an organism harboring virulent Koch's bacillus would according to Calmette create a state of hypersensitiveness to tuberculosis and reinfection. The general reaction in such instances would be analogous to the introduction of high doses of Old Tuberculin in tuberculous persons, which, as known, leads to disastrous results. Again from a practical point of view the vaccination of people containing in their organism virulent tubercle bacilli (evidenced by a positive Pirquet test) is useless since these persons have already been "vaccinated" naturally.

Clinical observation has shown that babies born of and reared by mothers with active tuberculosis almost invariably contract the disease within a short period of time following their birth. It has also been noted that tuberculosis contracted during the first year of life is particularly dangerous. In Paris, for instance, the mortality of such children, as given by official agencies, reaches about 32 per cent. Sporadic reports made by Léon Bernard, Debré and others indicate that the percentage is still higher. The figures of Frossner from Stockholm are to the effect that it is from 60 to 70 per cent.

It occurred then to Calmette to use his preventive vaccine with this class of children.

The clinicians Weill-Hallé and Turpin (2) were the first to apply the vaccine to babies. Two milligrams of the B.C.G. finely emulsified in human milk was given by mouth to infants at intervals of two days beginning with the third day after delivery. This way of administration was chosen because it is believed that the gastrointestinal mucosa in infants is a particularly favorable area for absorption.

Encouraged by the first successful results of the mentioned clinicians the Pasteur Institute decided to begin the vaccination experiments on a large scale. In 1924 Calmette began to distribute the vaccine B.C.G. for immunizing purposes to physicians throughout the country. Calmette's figures indicate that 21,000 vaccinations have been performed in France in the last three years (1924-1927). Calmette and his associates observed 982 babies whose vaccination dated back more than one year and who lived or were still living in contact with tuberculous persons. Of this number of vaccinated infants only about 1 per cent. died of tuberculosis. These figures are of particular importance when compared with the mortality from the same disease of non vaccinated infants which as stated above reached figures varying between 30 and 70 per cent.

What is the duration of the immunity created by the B.C.G.?

Active or passive immunity to common microorganisms is apparently never permanent. In some infections the immunization ought to be repeated from time to time and in a number of others we immunize ourselves "unconsciously" at certain intervals by picking up steadily a certain number of the germs from our surroundings. The "relative" immunity which most persons in civilized countries possess against tuberculosis is to all appearances conferred to them in this way. We become ill with tuberculosis only at the time when the amount of the picked up Koch's bacillus is very high thus overcoming the immunity (the state of allergy), or when the interval between these infections is very short in which case there is not enough time to confer a state of immunity. Since no person or animal had ever before the advent of Calmette been immunized effectively against tuberculosis the duration of the antituberculosis immunity could not be ascertained. As outlined above, the immunity to the Koch's bacillus exists as long as there is a "state of parasitism between the germ and the host," that is so long as there are living tubercle bacilli within the organism.

How soon then after inoculation does the organism eliminate the introduced B.C.G. thus losing its immunity?

The duration of the immunity to natural infection from the outside conferred by the B.C.G. can not be accurately estimated. Weill-Hallé and Turpin's observations indicate, however, that the resistance of vaccinated babies to infection with Koch's bacillus from the outside is apparently about four years. Calmette's experiments on cattle indicate about 20 months. But it will be remembered that natural infection in human beings and also in cattle is never as grave as experimental infection in which ordinarily massive doses of tubercle bacilli are used. The figures of the clinicians are then to all appearances reasonably correct. Now even if we are to suppose that the duration of immunity is much shorter, it fulfills none the less its purposes: As already noted the idea of the vaccination is to protect the baby during the first year of its life at which period the exposure to tuberculosis is usually fatal. Moreover, experiments have shown that animals and babies can be re-vaccinated with the B.C.G. at intervals without any untoward results.

To sum up: Calmette affirms that inoculation with the vaccine B.C.G. against phthisis in babies free from tuberculosis is harmless; and that the vaccine confers an effective immunity against infection with virulent Koch's bacillus.

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- 3 Calmette, A.: Sur la vaccination préventive des enfants nouveau-nés contre la tuberculose par le B.C.G. Ann. Inst. Past., 1927:21, Mar., 201.
4 Krause, Allen K., and Willis, H. S.: The influence of frequently repeated reinfections on allergy and immunity in Tuberculosis. Amer. Rev. of Tuberculosis, 1926:14, Sept., 116.

BREAST FEEDING CAMPAIGN IN FALL RIVER

Massachusetts Department of Public Health,
Editor Boston Medical and Surgical Journal,

An interesting breast-feeding campaign has been carried on during the past year in the City of Fall River. It culminated in a meeting of the Fall River Medical Society, July 13th, at which Dr. E. P. Ruggles spoke on the subject of Breast Feeding. Perhaps you would like to publish the appended report of this breast feeding campaign by Helen M. Hackett.

Very truly yours,
MERRILL CHAMPION, M.D.,
Director, Division of Hygiene.

BREAST FEEDING CAMPAIGN IN FALL RIVER

BY HELEN M. HACKETT, R.N.,
*Consultant in Public Health Nursing, State
Department of Public Health*

A breast feeding campaign was started in Massachusetts in 1925. A committee was appointed of members of the State Department of Public Health, to carry on this campaign, with the assistance of several of the local communities. Fall River was one of the communities selected. It was decided by the committee that an intensive district campaign be organized, with a view to establishing permanent work along this line in certain communities of the State. One member of the committee, a physician, addressed a meeting of the District Medical Society in Fall River, at which there were seventy-five physicians in attendance. The proposed program was outlined at this meeting and it met with the hearty approval of the members of the Society.

The first step taken was a questionnaire sent to the nurses in the community:

- What percentage of the total birth registration do you reach?
How soon after the birth are the babies reached?
How often are the babies visited up to the sixth month?
Would it be possible for you to extend the percentage of babies reached? If not, why not?
During 1925 how many babies under your care were breast fed for 6 months? Wholly? Partially?
How many mothers under your care were unable to nurse their babies for more than two months? Why?

It was the unanimous opinion of the Committee that the plan used with success in a similar experiment in Long Island be employed here in slightly modified form.

The following is the program as outlined for the nurses participating in the campaign:

(a) The State Department of Public Health to approach the local Board of Health or nursing organization and ask their cooperation in a demonstration in their community. This would mean:

1. To extend their service to cover all registered births.
2. To make at least two visits to mothers.

3. To visit doctors who filed birth certificates.

(b) If the nursing organization accepts the additional work involved, the nurse's first step is to visit the doctor who filed the birth certificate and find out from him whether he desires her to visit the baby. If he approves, her plan would be:

1. A visit to the mother of each new baby at the end of the second week, to find out if the baby is being breast-fed, and to give suggestions.
2. A visit at the end of the fourth week.

By such a plan it is hoped to accomplish:

1. An increase in the percentage of breast-fed babies.
2. Broadened interest in the subject on the part of physicians, nurses and mothers.
3. Valuable statistical returns to the State Department of Public Health.

The following narrative from the secretary of the Maternal and Child Welfare Commission in Fall River will give an idea as to how the campaign is being carried on there, and will show some of the results thus far.

"Special emphasis on breast feeding has been the rule of the Maternal and Child Welfare Commission of Fall River since its organization. This always has been necessary in a community where the textile industry offers the only means of livelihood for the majority of the people. Mothers are tempted, either by desire or necessity, to return to the mill as soon as they can after the baby's arrival. Therefore, the Commission was quite willing to cooperate with the State Department of Public Health in a breast feeding campaign.

"The preliminary work of the State Health Department, through which local doctors were interested and offered their cooperation, was helpful, as in the case of Mrs. Madeiros, who told the nurse her doctor had advised her to wean her baby when she was found one day giving him a bottle. On telephoning to the doctor, the nurse learned the mother had misunderstood his directions and was assured that he would 'back her up' in persuading the mother to discontinue the bottle. This the mother did and at six months the baby is thriving on the breast.

"The situation was entirely different with baby Henry, a beautiful breast fed baby at two months, who, because of too frequent nursing, began to vomit and to have curds in his stools. This worried his mother so much that on her own initiative she gave him supplementary feedings of a whole milk mixture, meaning to wean him entirely, believing her breast milk was disagreeing with him. The nurse called just in time to urge Mrs. Kirk to attend the Baby Conference next day. The conference doctor assured her that breast milk was best, gave her advice on her own dietary, and on personal hygiene. Within a week baby Henry was doing well without any artificial feedings.

"We cannot always claim success. Mrs. Remos did not want to continue nursing her six-weeks-old baby because she wanted to go to work. The nurse persuaded her to attend the Baby Conference, where the doctor spent some time trying to change her point of view. He thought he had succeeded, but he had not. She locked the door on the nurse two days later. She came into the conference station the next week to weigh the baby, refused to see the doctor, said she had weaned the baby entirely and had a job to go to next Monday (strange how mothers can find work when fathers cannot). The family moved soon and was lost track of.

"Bill's mother had pneumonia when he was one month old and his doctor advised against breast feeding. The nurse watched Bill failing for three weeks and then called up the doctor. With his permission

she put the baby back on the breast and now at five months Bill is fine and healthy. So is mother.

"Baby Desmorals went home from the hospital having one complementary feeding; soon she was having two. Her mother thought the supply of breast milk insufficient. No doctor had seen the baby since she went home. The nurse advised and urged the mother to discontinue one of the complementary feedings, then the second. In two weeks the mother and baby were happy and there was plenty of breast milk.

"Mrs. Piva was the mother of five children and she kept a little store. The store helped with the family income and, therefore, was important. The five babies had had mother's milk only the first week or two. Mrs. Piva always had a midwife, never bothered with doctors. The nurse had a big job ahead of her, but she waded in and now the baby is four months old and doing well on his mother's breast milk and the 'best baby the mother ever had,' and so on.

"When we consider our cosmopolitan population it is not so strange after all that word of mouth and person-to-person contacts are the most important means we have for putting over health educational measures, whether they are breast feeding or health examinations."

The statistical report following covers 100 cases.

STATISTICS ON BREAST FEEDING CAMPAIGN—FALL RIVER

<i>Multiparae</i>		76
I. Weaned at or before 6 months		
Age when completely weaned		Breast fed only, for
Less than 1 month	1	3
1 month	3	6
2 months	4	3
3 months	3	1
4 months	1	2
5 months	2	
6 months	2	1
Total	16	16
(a) Reasons for Weaning		
Breast milk "poor quality," scant, or failed		7
Advice of physician		4
Mother going to work		1
Breast abscess		1
Unknown		3
		16
II. Breast Fed 6 months		44
III. Breast and bottle 6 months		16
(a) Breast only for 1 month		2
2 months		6
3 months		3
4 months		1
5 months		4
		16
IV. Prenatal Care		
6 months		13
5 months		10
4 months		11
3 months		6
2 months		7
1 month		4
Less than 1 month		0
None		20
Unknown		5
Total		76

<i>Primiparae</i>		24 cases
I. Weaned at or before 6 months		
Age when weaned		Breast fed only, for
Less than 1 month	1	1
1 month	1	1
2 months	1	4
3 months	2	0
4 months	0	1
5 months	2	1
6 months	1	0
Total	8	8
(a) Reasons for Weaning		
Breast milk poor quality or failed		5
Baby not gaining or hungry		2
Unknown		1
Total		8
II. Breast fed 6 months		12
III. Breast and bottle 6 months		4
(a) Breast only for 1 month		1
2 months		1
3 months		1
4 months		1
		4
IV. Prenatal Care		
6 months		5
5 months		1
4 months		4
3 months		4
2 months		2
1 month		0
Less than 1 month		0
None		4
Unknown		4
Total		24

MASSACHUSETTS DEPARTMENT OF PUBLIC HEALTH

George H. Bigelow, M.D., Commissioner

COMMUNICABLE DISEASE BULLETIN No. 1

Anterior Poliomyelitis (Infantile Paralysis)

1927 Cases

City or town	January 1 to			Total for year January 1 to August 31
	June 30	July	August	
Agawam	—	—	1	1
Amesbury	—	—	2	2
Bellingham	1	—	—	1
Belmont	—	—	1	1
Boston	7	4	39	50
Brockton	—	1	1	2
Brookline	—	—	1	1
Cambridge	—	—	11	11
Canton	—	—	2	2
Chelsea	—	—	7	7
Cheshire	1	—	—	1
Colrain	—	—	2	2
Concord	—	—	1	1
Dedham	—	—	2	2
Easton	—	1	—	1
Everett	—	—	3	3
Fall River	2	—	1	3
Gardner	—	—	1	1

Georgetown	—	—	1	1
Gloucester	—	—	4	4
Hanover	—	—	1	1
Haverhill	1	1	23	25
Hingham	—	1	1	2
Holyoke	—	—	3	3
Hull	1	—	1	2
Lawrence	—	2	11	13
Lee	1	—	—	1
Lexington	—	—	1	1
Longmeadow	—	2	—	2
Lowell	—	—	1	1
Lynn	1	1	9	11
Malden	1	—	2	3
Medford	—	—	3	3
Melrose	—	—	1	1
Methuen	—	—	4	4
New Bedford	1	—	—	1
Newton	—	—	4	4
North Attleboro	1	—	1	2
Norwell	—	—	5	5
Peabody	1	—	—	1
Plymouth	—	—	2	2
Quincy	1	1	3	5
Revere	—	—	2	2
Rockland	—	—	1	1
Rockport	—	—	1	1
Shirley	1	—	—	1
Somerville	1	—	4	5
Springfield	2	1	3	6
Taunton	—	1	1	2
Wakefield	3	—	—	3
Wareham	1	—	—	1
Watertown	1	5	—	6
West Newbury	—	—	1	1
West Springfield	—	—	1	1
Westport	—	1	—	1
Winchester	—	—	1	1
Winthrop	—	—	1	1
Woburn	—	—	1	1
Worcester	4	—	4	8
Total	33	22	177	232

REPORTED INCIDENCE BY MONTHS,
JANUARY 1, 1920- AUGUST 31, 1927

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
1920	4	4	1	—	5	16	93	273	190	77	31	696	
1921	10	10	7	3	6	4	26	61	54	27	15	10	233
1922	8	4	4	3	—	4	23	54	63	28	21	5	217
1923	10	9	5	6	4	4	8	26	38	48	40	25	223
1924	14	6	9	7	5	5	12	39	88	56	23	13	277
1925	9	4	7	2	1	2	11	30	44	38	14	12	167
1926	6	4	5	5	4	5	21	75	59	27	26	8	245
1927	6	2	3	4	7	11	22	177					*232

*Total for 8 months.

The figures above are somewhat self explanatory. In 1920, 686 cases of poliomyelitis were reported. This incidence was about three times as high as for the six-year period that followed. The average number of cases for the period just mentioned (1921-1926) was 227, with little variation above or below that figure.

As was pointed out in a flyer sent you in July on the subject of poliomyelitis, past experience has shown that a decided increase in prevalence of this disease tends to follow consecutive quiet years.

The increased prevalence has been very definite, and as you will note has occurred through August. A study of the seasonal incidence of this disease in Massachusetts for the last seven years shows that the peak of prevalence has occurred about the middle of September.

The table by cities and towns shows the geographical location of the cases reported through August 31.

Although anterior poliomyelitis is familiarly known as "infantile paralysis," adults do have the disease. Nevertheless, 95 per cent. of cases occur in children under 10. According to Massachusetts figures for a nine-year period, the most common age of incidence is two, but the average age is six.

Since there is still uncertainty about the mode of spread of the disease, the exact measures for its control remain in doubt. For this reason the appearance of the disease causes unusual anxiety in a community. From what is known about the disease the following preventive measures can be sanely employed:

Patients with infantile paralysis should be isolated in the acute stage in much the same way as typhoid fever or diphtheria patients. It seems wise to treat all body discharges as infectious.

It is well to remember that healthy carriers or missed cases may play a large part in the dissemination of the disease. For this reason, contacts with cases should be isolated for the period of time which your rules and regulations call for, or the period recommended in the Minimum Quarantine Requirements issued by the Department of Public Health, copies of which you should have.

Since three authentic outbreaks spread by infected raw milk have been reported, it seems wise to protect against milk as well as other foods eaten raw. It would be absurd from this to look on milk as the only, or even the most common, method of spread of this disease, but it constitutes another argument for adequate pasteurization. It also emphasizes the need of scrupulous cleanliness in handling food to be eaten raw.

In addition to the diagnostic service offered through our State District Health Officers, the Department in cooperation with the Harvard Infantile Paralysis Commission is able to furnish special consultant service to physicians and boards of health.

Calls for this special service should be made to this Department.

September 1, 1927.

CONNECTICUT DEPARTMENT OF HEALTH

MORBIDITY REPORT FOR THE WEEK ENDING
AUGUST 27, 1927

Diphtheria	19	Influenza	1
Last week	15	Mumps	6
Scarlet fever	8	Paratyphoid fever	1
Last week	13	Pneumonia, lobar	7
Typhoid fever	2	Poliomyelitis	12
Last week	5	Septic sore throat	2
Measles	11	Tetanus	1
Last week	6	Tuberculosis, pulmo-	
Whooping cough	74	nary	14
Last week	28	Tuberculosis, other	
Bronchopneumonia	6	forms	1
Chickenpox	2	Gonorrhea	12
German measles	1	Syphilis	40

INCIDENCE OF COMMUNICABLE DISEASES FOR THE WEEK
ENDING SEPTEMBER 12

Diphtheria	23	Mumps	6
Last week	8	Paratyphoid fever	1
Diphtheria bacilli carriers	3	Pneumonia, lobar	10
Typhoid fever	6	Poliomyelitis	11
Last week	3	Septic sore throat	3
Scarlet fever	13	Tetanus	1
Last week	3	Trichinosis	2
Measles	8	Tuberculosis, pulmo-	
Last week	4	nary	34
Whooping cough	44	Tuberculosis, other	
Last week	32	forms	6
Bronchopneumonia	7	Gonorrhea	30
Chickenpox	8	Syphilis	35

BULLETIN OF THE CONNECTICUT STATE
DEPARTMENT OF HEALTH

FEWER TYPHOID CASES

ONLY 48 cases of typhoid fever have been reported in Connecticut for the first eight months this year as compared with 102 reported for the same period of 1926. The total of 165 cases reported during 1926 established a low record for the State. Unless an outbreak occurs during the next four months, the year 1927 bids fair to establish a still lower record. The following table gives the cases of typhoid fever reported in Connecticut by months since 1918:

	1918	1919	1920	1921	1922	1923	1924	1925	1926	1927
January	18	6	11	8	8	7	8	15	12	11
February	9	6	6	17	7	5	5	13	11	4
March	11	17	6	14	11	9	12	12	6	2
April	16	19	15	16	12	7	3	10	4	2
May	19	29	22	45	11	12	15	19	12	2
June	24	23	15	39	39	9	12	14	9	5
July	38	48	20	53	63	28	24	17	20	9
August	104	73	63	96	55	51	45	41	28	13
September	147	57	121	76	36	58	38	35	28	
October	30	68	62	51	41	60	30	42	17	
November	12	43	45	28	18	22	13	17	10	
December	19	16	40	17	14	27	33	30	8	
Total	443	415	426	460	315	295	238	265	165	

The following table gives the number of paratyphoid fever cases reported in Connecticut each month since 1918:

	1918	1919	1920	1921	1922	1923	1924	1925	1926	1927
January	—	—	—	—	1	5	4	—	—	2
February	—	—	—	—	—	1	6	23	3	—
March	—	—	—	—	—	—	1	5	1	1
April	1	—	—	—	—	2	—	10	5	2
May	—	—	1	31	2	—	—	10	—	—
June	—	—	1	3	3	—	1	4	—	1
July	1	3	3	2	—	1	—	—	1	—
August	1	5	2	8	5	4	2	4	4	3
September	7	2	4	2	1	1	1	9	5	—
October	1	5	—	—	2	1	—	3	3	—
November	—	1	—	1	1	—	2	—	—	—
December	1	2	—	1	—	—	—	2	—	—
Total	13	18	11	48	15	15	17	70	22	—

RECENT DEATHS

MACDONALD—DR. JOHN BERNARD MACDONALD, for eleven years superintendent of the Danvers State Hospital, died at Arlington, September 6, 1927, at the age of 53 years.

Dr. Macdonald was born in Nova Scotia on September 18, 1873, the son of Angus and Sarah (Rankin) Macdonald. He was graduated from Bowdoin Medical School in 1904, and from that year until 1907 was connected with the Maine Insane Hospital at Augusta, and for three years had charge of the convalescents of the Insane Hospital of Bangor and Augusta. He was the first assistant physician in charge of the infirmary hospital department in the New Hampshire State Hospital at Concord from 1907

to 1911, and then for a period in 1912 superintended the men's department of the Grafton State Hospital. He became assistant superintendent of the Danvers State Hospital in 1912, and four years later in 1916 he was appointed superintendent of the hospital.

He was a member of the American Medical Association, the Massachusetts Medical Society, the American Psychiatric Association and the New England Society of Psychiatry.

An able writer, Dr. Macdonald was a frequent contributor to magazines on medical subjects during his long career. He was a Mason and he belonged to the Danvers Rotary Club and the Republican Club of Salem.

Surviving him are his wife, Mrs. Elizabeth Macdonald; a son, John Macdonald, and a daughter, Elizabeth Macdonald, all of Arlington.

It will be noted that the number of paratyphoid fever cases reported have been small each year except for 1921 and 1925 when there were outbreaks of this disease. So far this year only 9 cases of paratyphoid fever have been reported. Thus it appears that the low number of typhoid fever cases reported is not due to better diagnosis that might result in classing cases as paratyphoid instead of typhoid.

Many factors have apparently conspired to cause this great reduction in typhoid incidence which is one of the many triumphs of modern preventive medicine. Water supplies are better safeguarded and many are treated to destroy disease germs. Most large milk supplies are pasteurized. People know better how to care for typhoid patients to prevent the spread of infection. More cleanly habits of living also afford protection. Speed the day when typhoid will be so rare as to be a medical curiosity.

GLENDEENING—DR. ROBERT THOMPSON GLENDEENING, a Fellow of the Massachusetts Medical Society since 1896, with a residence in Manchester, died at the Beverly Hospital, September 3, 1927, at the age of 62. He was a graduate of McGill University Faculty of Medicine in 1892.

TAFT—DR. MARY FLORENCE TAFT, a graduate of Boston University Medical School in 1887, died at her home in Cambridge, September 5, 1927, aged 74.

Dr. Taft was born in Putney, Vt., and was graduated from the Somerville High School in 1872. For four years she was in the cataloging department of the Harvard University library. Later she was graduated from the Misses Weston and Garland Kindergarten School, after which she taught in one of Mrs. Quincy Shaw's charity kindergartens, Cambridge, from 1878 to 1880.

Miss Taft established a private kindergarten in Newport, R. I., and was responsible for the establishment of the kindergarten system in the schools of that city. She subsequently entered the Boston University Medical School, from which she was graduated in 1887, remaining one year thereafter as resident house surgeon. Dr. Taft began her private practice in Middletown, Conn. From there she went to Waterbury, Conn., and then to Chicago, where she became engaged for two years in hospital and private practice, later becoming professor of gynecology in Hering Medical College of that city and a member of the college faculty. Dr. Taft returned to Massachusetts and practiced her profession in Newtonville, remaining there until she retired and then moved to Cambridge, where she had since made her home. She was a strict Hahnemannian physician, and a member of the International Hahnemannian Association, serving at one time as the association's vice-president.

She was a member of the Cambridge Society of the New Jerusalem (Swedenborgian). A brother, Dr. Charles H. Taft, dentist of Cambridge, survives her.

NOTICES

RECONSTRUCTION CLINIC

366 COMMONWEALTH AVENUE, BOSTON

The monthly clinical meetings will be held on the last Friday of each month beginning September 30, 1927, at 8:00 P. M., instead of Thursday as heretofore. Clinical cases will be demonstrated as well as the application of various modalities for physical therapeutics.

All regular physicians of good standing are welcome.

THE COMMONWEALTH OF MASSACHUSETTS, DEPARTMENT OF MENTAL DISEASES

ANNOUNCEMENT OF AFFILIATED COURSES IN MENTAL NURSING

THE Massachusetts State Department of Mental Diseases calls attention to the establishment of a three months' course of formal instruction in Psychiatry and Mental Nursing in the State Hospitals under its direction. This course is available for classes in training at approved schools of nursing in tax-free hospitals incorporated in Massachusetts. Affiliation under the above plan was established nearly a year ago by the Boston Psychopathic and Worcester State

Hospitals with several general hospitals in this state and has been in continuous and successful operation since its inception. Similar courses will be conducted at other Massachusetts State Hospitals as rapidly as arrangements can be made, in accordance with the requests from schools of nursing for special training in this subject. These affiliated courses do not take the place of the schools of nursing maintained by the state hospitals, which will be continued as heretofore. Further details regarding the new course in psychiatric nursing may be had by those interested by communicating with the Department of Mental Diseases.

GEORGE M. KLINE, M.D., *Commissioner*,
Room 109, State House, Boston, Mass.
August 25, 1927

ARTICLES ACCEPTED BY THE COUNCIL ON PHARMACY AND CHEMISTRY OF THE AMERICAN MEDICAL ASSOCIATION

535 North Dearborn Street, Chicago, Ill.,
August 27, 1927.

Editor, Boston Medical and Surgical Journal:

In addition to the articles enumerated in our letter of July 30 the following have been accepted:

Abbott Laboratories

Acetarsone

Amlodoxyl Benzoate—Abbott

Ephedrine Sulphate—Abbott

H. K. Mulford Company

Diphtheria Toxin-Antitoxin Mixture, New Formula, Park-Banzhaf's 0.1 L+

Erysipelas Streptococcus Antitoxin (Concentrated)—Mulford

Nonproprietary Articles

Amlodoxyl Benzoate

Yours truly,

W. A. PUCKNER, *Secretary*,
Council on Pharmacy and Chemistry.

UNITED STATES PUBLIC HEALTH SERVICE

CHRONOLOGICAL LIST OF CHANGES OF DUTIES AND STATIONS OF COMMISSIONED AND OTHER OFFICERS OF THE UNITED STATES PUBLIC HEALTH SERVICE

AUGUST 24, 1927

Acting Assistant Surgeon Charles Bolduan—Directed to proceed from Bremen, Germany, to Hamburg, Germany, and return, for temporary duty—August 12, 1927.

Surgeon W. H. Frost—Directed to proceed from Baltimore, Md., August 16, to Washington, D. C., for conference at the Bureau, and return—August 15, 1927.

Acting Assistant Surgeon W. P. Woodall—Directed to proceed from Hidalgo, Tex., to Brownsville, Tex., and return, to serve as recorder of a board—August 15, 1927.

Sanitary Engineer H. R. Crohurst—Relieved from duty at Minneapolis, Minn., and directed to proceed to Cincinnati, Ohio, and report to the officer in charge, Stream Pollution Investigations, for duty—August 17, 1927.

Passed Assistant Surgeon K. F. Maxcy—Directed to proceed on August 17, from Washington, D. C., to Richmond, Va., and such points in that vicinity as

may be necessary, and return, for the investigation of cases of typhus fever—August 17, 1927.

Assistant Surgeon General W. F. Draper—Directed to proceed from Washington, D. C., to Memphis, Tenn., and Little Rock, Ark., and return, for conferences with State and local health authorities relative to the prevention of the spread of epidemic diseases in the flooded area—August 18, 1927.

Surgeon L. L. Lumsden—Directed to proceed on August 18 from Washington, D. C., to Richmond, Va., and such other places in the State of Virginia as may be necessary, and return, to confer with State and local health authorities relative to rural sanitation work—August 18, 1927.

Acting Assistant Surgeon B. C. Barentine—Directed to proceed from Carville, La., to Asheville, N. C., and such other points in that vicinity as may be necessary, to obtain the custody of a leper and to accompany him to U. S. M. H. No. 66, Carville—August 18, 1927.

Acting Assistant Surgeon C. C. Gollinger—Directed to proceed from Brooklyn, N. Y., to Ellis Island, N. Y., and report to the Chief Medical Officer for duty—August 18, 1927.

Surgeon L. E. Hooper—Bureau orders of August 19, 1927, revoked. Relieved from duty at Stapleton, N. Y., and directed to proceed to Galveston, Tex., and assume charge of Service activities at that place—August 18, 1927.

Surgeon L. L. Williams, Jr.—Directed to proceed on August 22, from Richmond, Va., to Washington, D. C., and return, for conference at the Bureau—August 19, 1927.

Acting Assistant Surgeon William Hollister—Directed to proceed from Washington, D. C., to Ellis Island, N. Y., for assignment to duty—August 19, 1927.

Surgeon W. H. Slaughter—Directed to proceed from Galveston, Tex., to Freeport, Tex., and return, in connection with quarantine activities at that place—August 20, 1927.

Acting Assistant Surgeon W. I. Hinkle—Directed to proceed from Ellis Island, N. Y., to Portland, Me., and return, for temporary duty at U. S. M. H. No. 16—August 23, 1927.

Acting Assistant Surgeon Amos E. Johns—Directed to proceed from Plano, Tex., to Ellis Island, N. Y., and report to the Chief Medical Officer for duty—August 23, 1927.

Acting Assistant Surgeon S. B. Gillespie—Directed to proceed from Camp Meade, Md., to Port Arthur, Tex., for assignment to duty at U. S. P. H. S. Relief Station No. 309—August 24, 1927.

BOARD CONVENED

A board of officers convened to meet at Brownsville, Tex., September 1, 1927, for the reexamination of two aliens—August 15, 1927. Detail for the board: A. A. Surgeon G. D. Fairbanks, chairman; A. A. Surgeon W. R. Spivey, member; A. A. Surgeon W. F. Woodall, recorder.

Official:

H. S. CUMMING, Surgeon General.

REPORTS AND NOTICES OF MEETINGS

THE ANNUAL MEETING OF THE NEW HAMPSHIRE SURGICAL CLUB

The 30th annual meeting of the New Hampshire Surgical Club was held at Laconia Tavern, Laconia, N. H., Monday, September the 19th, 1927. This was the occasion of a week-end outing for members, their families, and guests

beginning Saturday, September the 17th, 1927. Special arrangements were made for golf. A committee of arrangements consisting of the Laconia members and their ladies together with the Belknap County Medical Society arranged the details.

Sunday evening the Belknap County Medical Society gave a complimentary supper and entertainment at the Laconia Country Club. Monday afternoon the Laconia ladies' committee arranged a bridge party for the ladies.

The program was as follows:

6:30, SUNDAY EVENING, SEPTEMBER 18, 1927

Supper and entertainment, Country Club. Members, ladies and guests. Courtesy of Belknap County Medical Society.

10 A. M., MONDAY, SEPTEMBER 19, 1927

Round table conference and general discussion

1. Medical education and distribution of physicians in New Hampshire. Opened by George C. Wilkins, M.D.
 2. What measures should be taken to prevent incompetent and unnecessary surgery? Opened by Robert Holmes, M.D.
 3. Ethics and fees. Opened by Clarence Butterfield, M.D.
 4. Which is to be desired, the open or the closed hospital? Opened by Richard W. Robinson, M.D.
- Other topics may be substituted or presented from the floor.

Afternoon Program

- 1 P. M. Annual business meeting including election of officers.
President's Address, Eugene B. Eastman, M.D.
Paper: Intestinal Obstruction, Chester L. Smart, M.D. Discussion, Herbert L. Taylor, M.D., B. G. Morin, M.D.
- Presentation of an interesting case, Robert Flanders, M.D. Discussion, Benjamin Burpee, M.D., A. S. Merrill, M.D., David W. Parker, M.D., H. N. Kingsford, M.D.
Paper: Operations on the Aged, Charles Lund, M.D., Boston, Mass. Discussion, Emery Fitch, M.D., Arthur T. Downing, M.D.
- Banquet, 7 P. M. Ladies and guests invited. Toastmaster: Thomas C. Luce, M.D.
An interesting after-dinner program has been arranged.

UNION HOSPITAL IN FALL RIVER

CLINICAL STAFF MEETING

The Regular Monthly Clinical Staff Meeting will be held at the Stevens Clinic on Thursday, Sept. 22, 1927, at 8:15 P. M.

All Physicians interested are cordially invited.

M. N. TENNIS, M.D., Secretary.

THE ANNUAL MEETING OF THE AMERICAN SOCIETY OF TROPICAL MEDICINE

The 23rd annual meeting of The American Society of Tropical Medicine will be held in Boston, Oct. 21, and 22, in the Amphitheatre Building E, Harvard Medical School.

Dr. George C. Shattuck, Harvard Medical School, Boston, is the president of the Society.

BENJAMIN SWARTZ, *Secretary.*

P. O. Box 131, Pennsylvania Avenue
Station, Washington, D. C.

THE CLINICAL CONGRESS OF AMERICAN COLLEGE OF SURGEONS

THIS meeting will be held in Detroit, October 3-7, 1927. The complete program has been mailed to Fellows of the American College of Surgeons. The papers and discussions will be of high order.

Dr. George David Stewart of New York will deliver the Presidential Inaugural address, and Sir John Bland-Sutton, Bt., LL.D., M.D., F.R.C.S., London, will deliver the John B. Murphy Oration in Surgery.

THE MEETING OF THE AMERICAN PUBLIC HEALTH ASSOCIATION WILL TAKE PLACE AT THE HOTEL GIBSON, CINCINNATI, OHIO, OCTOBER 17-21, 1927

THE preliminary program has been sent out and indicates a remarkable series of papers and discussions on practically all phases of health work.

In addition to two general sessions there will be six special sessions, four joint sessions, twenty-two sessions of section, eight dinner and luncheon sessions, as well as many social functions. About one hundred and sixty speakers are scheduled. This meeting will be of inestimable value to all interested in public health.

Send to A. P. H. A. headquarters for programs.

A MEETING OF THE PRESIDENTS AND SECRETARIES OF THE DISTRICT SOCIETIES OF THE MASSACHUSETTS MEDICAL SOCIETY

On September 14, 1927, Dr. John M. Birnie, President of the Massachusetts Medical Society entertained the Presidents and Secretaries of the District Societies at luncheon at the Harvard Club of Boston.

Dr. Birnie in his address told his audience that he had called the meeting for the purpose of discussing such matters as seem to be of importance at the present time, relating to the affairs of the Society, in order to get the opinions of representatives of the members throughout the state. He felt that, although it is the function of the President to take the initiative in many matters, he is the servant of the Society and should work to promote such modifications and improvements in the functions of the Society as may be approved by the Society at large.

He felt that discussions in advance of Council meetings would promote intelligent handling of the business because of the opportunity for con-

sideration by the officers of the district societies.

Attention was called to the conflict in dates of the meetings of our Society and the A. M. A. which seems to require a change on our part. The advantages of accepting invitations from other sections of the State for holding the next meeting outside of Boston may have to be considered. The very successful meetings in Pittsfield and Springfield furnish cogent arguments for meetings in different sections.

From his experience on the Board of Registration and association in other organizations with people interested in education, the President felt that Massachusetts is not keeping step with other states in adopting adequate standards for its educational institutions and the so-called high school requirements which have a bearing on the education of doctors and nurses is especially open to criticism, due in large measure to the fact that the commissioner of education has little power beyond recommending the quality of courses of instruction in our schools.

Since little progress has been made in legal requirements for standards of medical practice of late years he urged the careful study and united action in efforts to bring about improvement.

One of the most important suggestions centered about the need for a "home" for the Society. By this, the President explained, is meant accommodations for the adequate functioning of the Society for, although a few rooms are now occupied by the JOURNAL in association with a small committee room, the facilities for conducting business are far from satisfactory. In common with others of experience he felt that much more space should be provided where the President could have accommodations for stenographic service, general office equipment and opportunities for conferences. He explained how important it is to be able to conduct business in an efficient way and how much had been done by past presidents under definite handicaps.

These thoughts led up to the desirability or even the necessity of having an agent of the Society who could devote a considerable proportion of time to such matters as may reasonably be expected by the officers and committees of the Society. Such officials under the title of Field Agent, Executive Secretary or Manager are employed by several state societies and are able to contribute service which is neglected in some instances or performed at expense of time and effort by the officers of the Society without recompense.

Such an official would need adequate office equipment for he would act as an executive when needed in doing publicity work, representing the Society on various occasions, and attending to many details.

The President further explained the need for a Society home in the growing activities of the JOURNAL which, under plans for changes and

growth in association with other state societies, should have better accommodations. He gave time to the Managing Editor of the JOURNAL who supplemented the remarks of the President by explanations of some more details about the routine work done in the JOURNAL office, time given to requests for information and explained plans for the future.

Reference was made to the present complications relating to indemnity insurance and the President informed the meeting that careful consideration is being given to this subject.

The Vice-President, Dr. Thomas J. O'Brien, addressed the meeting and spoke forcibly and eloquently on the necessity of having an executive officer who could augment the work of the President, Secretary and the committees. He clearly indicated the great possibilities of more efficiency in present activities and opportunities for bringing about unanimity of action when it seems necessary to arouse concentrated effort on public questions.

The meeting was attended by nearly all of the presidents and secretaries of the district societies and much interest was shown in the matters presented. We predict that the Council Meeting will reflect the enthusiasm of the President and if such meetings are held regularly more thought will be given to the subjects which will be scheduled in the programs for Council Meetings.

LECTURES BY SIR SCOTT SHERRINGTON UNDER THE EDWARD K. DUNHAM FOUNDATION

SIR CHARLES SCOTT SHERRINGTON, Professor of Physiology at Oxford University, England, will deliver a series of three lectures at Harvard Medical School, at five P. M., under the Edward K. Dunham Foundation.

Monday, October 19, "Observations on Stretch Reflexes."

Thursday, October 13, "Modes of Interaction Between Reflexes."

Monday, October 17, "Some Factors of Coordination in Muscular Acts."

PROGRAM OF INTER-STATE POST GRADUATE ASSEMBLY OF NORTH AMERICA, KANSAS CITY, MO., OCTOBER 17-20, 1927

FIRST DAY—MONDAY, OCTOBER 17

7 A. M.

Diagnostic Clinic (Gynecological)—Dr. Irvin Abell, Professor of Clinical Surgery, University of Louisville Medical Department, Louisville, Ky.

Diagnostic Clinic (Pediatrics)—Dr. Alan Brown, Professor of Pediatrics, University of Toronto, Faculty of Medicine, Toronto, Canada.

Diagnostic Clinic (Surgical)—Mr. John S. McArdle, F.R.C.S.I., Professor of Surgery, University College, Dublin, Ireland.

Intermission—View Exhibits.

Diagnostic Clinic (Pediatric)—Dr. McKim Marriott, Dean and Professor of Pediatrics, Washington University School of Medicine, St. Louis, Mo.

Diagnostic Clinic (Gynecological)—Dr. William B.

Hendry, Professor of Obstetrics and Gynecology, University of Toronto, Faculty of Medicine, Toronto, Canada.

Diagnostic Clinic (Medical)—Dr. Edward Strecker, Professor of Nervous and Mental Diseases, Jefferson Medical College, Philadelphia, Pa.

AFTERNOON SESSION—1 P. M.

Diagnostic Clinic (Medical)—Dr. Otto J. Kauffman, Professor of Medicine, University of Birmingham, Birmingham, England.

Gynecology and Obstetrics—Symposium

The Bleeding Uterus—Dr. Irvin Abell, Professor of Clinical Surgery, University of Louisville Medical Department, Louisville, Ky.

The Significance of Abdominal Pain in Gynecological Conditions—Dr. William B. Hendry, Professor of Obstetrics and Gynecology, University of Toronto, Faculty of Medicine, Toronto, Canada.

The Modern Trend in Midwifery and Gynecology—Dr. R. P. Ranken Lyle, Professor of Obstetrics and Gynecology, University of Durham, Newcastle-upon-Tyne, England.

Subject to be announced—Dr. Ersilio Ferroni, Professor of Obstetrics and Gynecology, University of Florence, Florence, Italy.

Intermission—View Exhibits.

The Particular Features of Italian Gynecology and Obstetrics—Dr. Luigi Mangiagalli, Dean and Professor of Obstetrics and Gynecology, Royal Clinical Institute, Milan, Italy.

The Mechanism of the Migration of the Ovum, and the Etiology of Tubal Pregnancy with Special Reference to the Origin of Indirect Migration—Professor Pasquale Sfameni, Rector of the Royal University and Director of the Obstetric-Gynecological Clinic, Bologna, Italy.

Pediatric—Symposium

The Daily Variation of Sunlight and Its Effect on Growth and Resistance to Disease—Dr. Alan Brown, Professor of Pediatrics, University of Toronto, Faculty of Medicine, Toronto, Canada.

The Sequelae of Acute Infectious Diseases in Children with Special Reference to Their Effect upon the Kidneys—Dr. McKim Marriott, Dean and Professor of Pediatrics, Washington University School of Medicine, St. Louis, Mo.

The Significance of Basal Metabolism in Children—Dr. Fritz B. Talbot, Clinical Professor of Pediatrics, Medical School of Harvard University, Boston, Mass.

Subject to be announced—Professor Adolpho Maffei, Chief of the Hospital Service and Head of the Surgical Department of the Pediatric Clinic, University of Brussels, Brussels, Belgium.

EVENING SESSION—7 P. M.

The Importance of Examination of the Spine in the Presence of Intrathoracic or Abdominal Pain—Dr. John Phillips, Assistant Professor of Therapeutics, Western Reserve University, School of Medicine; Director, Cleveland Clinic, Cleveland, Ohio.

Subject to be announced—Mr. John S. McArdle, F.R.C.S.I., Professor of Surgery, University College, Dublin, Ireland.

The Relation of Focal Infections to Certain Systemic Conditions—Dr. Charles H. Neilson, Professor of Medicine, St. Louis University School of Medicine, St. Louis, Mo.

Factors Fundamental to the Healing of Tuberculosis—Dr. Francis M. Pottenger, Monrovia, Calif.

Some Problems in the Etiology of Heart Failure—Sir John F. H. Broadbent, F.R.C.P., London, England.

Poliomyelitis—Dr. Milton J. Rosenau, Professor of Preventive Medicine and Hygiene, Medical School of Harvard University, Boston, Mass.

New Investigations on the Physiology and Chemistry of the Male and Female Hormones—Dr. Sigmund Frankel, Professor of Experimental Medicine, Imperial Royal University of Vienna, Vienna, Austria.

SECOND DAY—TUESDAY, OCTOBER 18

7 A. M.

Diagnostic Clinic (Surgical)—Dr. Arthur Dean Bevan, Professor of Surgery, Rush Medical College, Chicago, Illinois.

Diagnostic Clinic (Medical)—Dr. Elliott P. Joslin, Professor of Clinical Medicine, Medical School of Harvard University, Boston, Mass.

Diagnostic Clinic (Pediatric)—Dr. Fritz B. Talbot, Clinical Professor of Pediatrics, Medical School of Harvard University, Boston, Mass.

Intermission—View Exhibits.

Diagnostic Clinic (Surgical)—Dr. William D. Haggard, Professor of Clinical Surgery, Vanderbilt University, School of Medicine, Nashville, Tenn.

Diagnostic Clinic (Surgical)—Dr. Dean Lewis, Professor of Surgery, Johns Hopkins University, Medical Department, Baltimore, Md.

Diagnostic Clinic (Surgical)—Dr. Nathaniel Allison, Professor of Orthopedic Surgery, Medical School of Harvard University, Boston, Mass.

AFTERNOON SESSION—1 P. M.

Diagnostic Clinic (Gynecological)—Dr. R. P. Ranken Lyle, Professor of Obstetrics and Gynecology, University of Durham, Newcastle-upon-Tyne, England.

Diseases of the Stomach—Symposium

The Early Diagnosis and Radical Operative Treatment of Carcinoma of the Stomach—Dr. Arthur Dean Bevan, Professor of Surgery, Rush Medical College, Chicago, Illinois.

The Significance of Gastric Hemorrhage—Dr. Frank Smithies, Professor of Medicine, Northwestern University Medical School, Chicago, Ill.

The Surgical Treatment of Gastric Ulcers, with Special Reference to the Massive Ulcers—Mr. Garnett Wright, F.R.C.S., Honorary Surgeon, Salford Royal Hospital; Lecturer in Surgical Pathology, Victoria University, Manchester, England.

The Relation of Cancer of the Stomach to Ulcer—Dr. Alfred S. Warthin, Professor of Pathology, University of Michigan, Ann Arbor, Mich.

Intermission—View Exhibits.

Diabetes—Symposium

The Liberation of Insulin and the Relation of This Hormone to the Other Internal Secretions—Dr. C. H. Best, Associate Professor of Medical Research, University of Toronto, Faculty of Medicine, Toronto, Canada.

The Ten-Year Diabetic—What he should be and how it can be brought about—Dr. Elliott P. Joslin, Professor of Clinical Medicine, Medical School of Harvard University, Boston, Mass.

Hyperthyroidism and Diabetes—Dr. Henry J. John, Cleveland Clinic, Cleveland, Ohio.

Renal Factors in Diabetic Coma—Dr. I. Snapper, Professor of Pathology, University of Amsterdam, Amsterdam, Holland.

The Relation of Focal Infections to Pancreatic Function with Special Reference to the Etiology of Diabetes—Dr. John C. Meakins, Professor of Medicine, McGill University, Faculty of Medicine, Montreal, Canada.

EVENING SESSION—7 P. M.

The Psychoses of Different Age Periods—Dr. Edward Strecker, Professor of Nervous and Mental Diseases, Jefferson Medical College, Philadelphia, Pa.

Diseases of the Bones and Joints—Symposium

Early Operation with Early Function in Certain Types of Fracture—Dr. Nathaniel Allison, Professor of Orthopedic Surgery, Medical School of Harvard University, Boston, Mass.

Acute Non-Tuberculous Ilio-Psoas Infections—Dr. Leroy Long, Dean and Professor of Surgery, University of Oklahoma, School of Medicine, Oklahoma City, Oklahoma.

Osteomyelitis—Dr. Dean Lewis, Professor of Surgery, Johns Hopkins University, Medical Department, Baltimore, Md.

Trauma of the Knee-Joint—Dr. John J. Moorhead, Professor of Surgery, New York Post Graduate Medical School, New York, N. Y.

New Ways of Dealing with Fractures and Injuries of Articulations with Special Consideration of their Functional Treatment (Moving Pictures)—Dr. Fritz Steinmann, Professor of Orthopedic Surgery, University of Berne, Berne, Switzerland.

THIRD DAY—WEDNESDAY, OCTOBER 19

7 A. M.

Diagnostic Clinic (Surgical)—Dr. Frank H. Lahey, Boston, Mass.

Diagnostic Clinic (Medical)—Dr. Charles A. Elliott, Professor of Medicine, Northwestern University, School of Medicine, Chicago, Ill.

Diagnostic Clinic (Neurosurgical)—Dr. A. W. Adson, Associate Professor of Surgery, University of Minnesota, Post-Graduate School of Medicine, Mayo Foundation, Rochester, Minn., and Dr. Harry L. Parker, Consulting Neurologist, Mayo Clinic, Rochester, Minn.

Intermission—View Exhibits.

Diagnostic Clinic (Surgical)—Dr. Walter E. Dandy, Professor of Clinical Surgery, Johns Hopkins University, Medical Department, Baltimore, Md.

Diagnostic Clinic (Medical)—Dr. James H. Means, Professor of Clinical Medicine, Medical School of Harvard University, Boston, Mass.

Diagnostic Clinic (Surgical)—Dr. Robert S. Dinsmore, Cleveland Clinic, Cleveland, Ohio.

AFTERNOON SESSION—1 P. M.

Thyroid Gland—Symposium

The Malignant Thyroid—Dr. Allen Graham, Assistant Professor of Surgery, Western Reserve University, School of Medicine, Cleveland, Ohio.

End Results of Radiation Therapy in the Treatment of Carcinoma of the Thyroid Gland—Dr. U. V. Portmann, Cleveland Clinic, Cleveland, Ohio.

The Technique of Thyroidectomy—Dr. Frank H. Lahey, Boston, Mass.

Iodin in the Management of Goiter Patients—Dr. Clarence G. Toland, Los Angeles, Calif.

Intrathoracic Goiter—Dr. George J. Heuer, Professor of Surgery, University of Cincinnati, College of Medicine, Cincinnati, Ohio.

Intermission—View Exhibits.

Cardiac Disturbances Associated with Hyperthyroidism—Dr. Charles A. Elliott, Professor of Medicine, Northwestern University, School of Medicine, Chicago, Ill.

Parathyreoprival Tetany—J. B. Collip, Ph.D., D.Sc., Professor of Biochemistry, University of Alberta, Edmonton, Canada.

A New Method of Surgical Treatment of Stenosis of the Larynx—Professor E. Schmiegelow, Professor of Otolaryngology, University of Copenhagen, Copenhagen, Denmark.

Tabetic Atrophy of the Optic Nerves—Professor Carl Behr, Hamburg, Germany.

Pernicious Anemia with Special Reference to Treatment with High Protein Diet—Dr. Clarence M. Grigsby, Professor of Medicine, Baylor University, Dallas, Texas.

EVENING SESSION—7 P. M.

Vagaries of Skin—Sir John Bland-Sutton, F.R.C.S., London, England.

Cancer—Symposium

The Danger of Incomplete Removal of Small and Apparently Innocent Lesion—Dr. Joseph C. Bloodgood, Associate Professor of Clinical Surgery, Johns Hopkins University, Medical Department, Baltimore, Md.

The Treatment of Laryngeal Carcinoma—Dr. Field

ing O. Lewis, Professor of Laryngology, Jefferson Medical College, Philadelphia, Pa.

The X-ray Treatment of Epithelioma of the Face—Dr. James M. Martin, Professor of Roentgenology, Baylor University, College of Medicine, Dallas, Texas.

Intestines—Symposium

Appendicitis—Dr. Jabez Jackson, President, American Medical Association, Kansas City, Mo.

The Management of Acute and Sub-Acute Intestinal Obstruction—Dr. William D. Haggard, Professor of Clinical Surgery, Vanderbilt University, School of Medicine, Nashville, Tenn.

The Mechanism of the Physiological Cecal Block and a Suggestion of a Simple Surgical Treatment—Dr. Rea E. Smith, Los Angeles, Calif.

FOURTH DAY—THURSDAY, OCTOBER 20

7 A. M.

Diagnostic Clinic (Medical)—Dr. Harlow Brooks, Professor of Clinical Medicine, University of Bellevue Medical College, New York, N. Y.

Diagnostic Clinic—Dr. Leonard G. Rowntree, Professor of Medicine, University of Minnesota, Post-Graduate School of Medicine, Mayo Foundation, Rochester, Minn.

Diagnostic Clinic (Surgical)—Dr. William E. Lower, Associate Professor of Genito-Urinary Surgery, Western Reserve University, School of Medicine; Director, Cleveland Clinic, Cleveland, Ohio.

Intermission—View Exhibits.

Diagnostic Clinic (Surgical)—Dr. Joseph H. Bloodgood, Associate Professor of Clinical Surgery, Johns Hopkins University, Medical Department, Baltimore, Md.

Diagnostic Clinic (Medical)—Dr. David P. Barr, Professor of Medicine, Washington University, School of Medicine, St. Louis, Mo.

Diagnostic Clinic (Laryngological)—Dr. Fielding O. Lewis, Professor of Laryngology, Jefferson Medical College, Philadelphia, Pa.

AFTERNOON SESSION—1 P. M.

Diagnostic Clinic—Dr. Hugh Cabot, Dean and Professor of Surgery, University of Michigan, Medical School, Ann Arbor, Mich.

The Lungs and Bronchi—Symposium

The Treatment of Pneumonia—Dr. Harlow Brooks, Professor of Clinical Medicine, University of Bellevue Medical College, New York, N. Y.

The Significance of Certain Abnormalities of Respiration—Dr. David P. Barr, Professor of Medicine, Washington University, School of Medicine, St. Louis, Mo.

The Role of Bronchoscopy in the Diagnosis and Treatment of Diseases of the Lungs—Dr. Gabriel Tucker, Associate Professor of Bronchoscopy and Esophagoscopy, Graduate School of Medicine and the University of Pennsylvania, Philadelphia, Pa.

Bronchopneumonia—Dr. Giuseppe Franchini, Professor of Pathology, Royal University of Bologna, Bologna, Italy.

Intermission—View Exhibits.

Urinary System—Symposium

Silent Lesions of the Upper Urinary Tract—Dr. William E. Lower, Associate Professor of Genito-Urinary Surgery, Western Reserve University, School of Medicine; Director, Cleveland Clinic, Cleveland, Ohio.

Infections of the Urinary Tract—Dr. Hugh Cabot, Dean and Professor of Surgery, University of Michigan, Medical School, Ann Arbor, Mich.

Transplantation of the Ureters—Dr. Robert C. Coffey, Portland, Ore.

EVENING SESSION—7 P. M.

The Combat Against Leprosy—Dr. Paul Unna, Hamburg, Germany.

The Other Page of the Ledger—Mortality in Operations—Dr. John F. Erdmann, Professor of Surgery, New York Post-Graduate Medical School, New York, N. Y.

Subject to be announced—Dr. J. Marinho, Professor of Clinical Oto-Rhino-Laryngology, Rio de Janeiro, Brazil.

Associated Abdominal Diseases—Dr. Charles H. Mayo, Professor of Surgery, University of Minnesota Medical School, Rochester, Minn.

Brain and Central Nervous System—Symposium

The Results of Sympathectomy in the Treatment of Raynaud's and Buerger's Disease—Dr. A. W. Adson, Associate Professor of Surgery, University of Minnesota, Post-Graduate School of Medicine, Mayo Foundation, Rochester, Minn.

Anatomy and Clinical Importance of the Ear Findings in the Neurological Symptom Complex—Dr. Gustav Alexander, Professor of Diseases of the Ear, University of Vienna, Vienna, Austria.

The Treatment of Tic Douloureux—Dr. Walter E. Dandy, Johns Hopkins University, Medical Department, Baltimore, Md.

FIFTH DAY—FRIDAY, OCTOBER 21

7 A. M.

Diagnostic Clinic (Surgical)—Dr. E. Starr Judd, Professor of Surgery, University of Minnesota, Post-Graduate School of Medicine, Mayo Foundation, Rochester, Minn.

Diagnostic Clinic (Medical)—Dr. Frederick J. Katterer, Associate Professor of Medicine, Jefferson Medical College, Philadelphia, Pa.

Diagnostic Clinic (Surgical)—Dr. George W. Crile, Professor Emeritus of Surgery, Western Reserve University, School of Medicine; Director, Cleveland Clinic, Cleveland, Ohio.

Intermission—View Exhibits.

Diagnostic Clinic (Surgical)—Dr. Charles H. Mayo, Professor of Surgery, University of Minnesota Medical School, Rochester, Minn.

Diagnostic Clinic (Medical)—Dr. Lewellys F. Barker, Emeritus Professor of Medicine, Johns Hopkins University, Medical Department, Baltimore, Md.

Diagnostic Clinic (Surgical)—Dr. John B. Deaver, Emeritus Professor of Surgery, University of Pennsylvania Medical School, Philadelphia, Pa.

AFTERNOON SESSION—1 P. M.

Diagnostic Clinic (Surgical)—Dr. John F. Erdmann, Professor of Surgery, New York Post-Graduate Medical School, New York, N. Y.

Gall-Bladder and Liver—Symposium

The Surgical Treatment of Diseases of the Biliary Tract—Dr. E. Starr Judd, Professor of Surgery, University of Minnesota, Post-Graduate School of Medicine, Mayo Foundation, Rochester, Minn.

The Significance of Jaundice—Dr. John B. Deaver, Emeritus Professor of Surgery, University of Pennsylvania, Medical School, Philadelphia, Pa.

Relation of the Liver to the Surgical Risk in Cases of Gall-Bladder and Duct Disease—Dr. George W. Crile, Professor Emeritus of Surgery, Western Reserve University, School of Medicine; Director, Cleveland Clinic, Cleveland, Ohio.

The Physiology of the Liver and Gall-Bladder—Dr. Frank C. Mann, Professor of Experimental Surgery and Pathology, University of Minnesota, Post-Graduate School of Medicine, Mayo Foundation, Rochester, Minn.

Present Knowledge Concerning Test of Liver Function—Dr. Leonard G. Rowntree, Professor of Medi-

cine, University of Minnesota, Post-Graduate School of Medicine, Mayo Foundation, Rochester, Minn.
Differential Diagnosis of Diseases of the Gall-Bladder—Dr. David Reisman, Professor of Clinical Medicine, University of Pennsylvania, School of Medicine, Philadelphia, Pa.

Heart and Circulatory System—Symposium

Coronary Thrombosis—Incidence, Prevention and Treatment—Dr. Lewellys F. Barker, Emeritus Professor of Medicine, Johns Hopkins University, Medical Department, Baltimore, Md.

Angina Pectoris—Dr. Frederick J. Katterer, Associate Professor of Medicine, Jefferson Medical College, Philadelphia, Pa.

Relation of the Endocrines to Certain Circulatory Diseases—Dr. James H. Means, Professor of Clinical Medicine, Medical School of Harvard University, Boston, Mass.

Gastro-Intestinal Auto-Intoxication as a Factor in Nervous Disorders—Dr. Otto J. Kauffman, Professor of Medicine, University of Birmingham, Birmingham, England.

CORRESPONDENCE

LECTURES ON THE CARE OF THE PATIENT

September 14, 1927.

Editor, Boston Medical and Surgical Journal:

The lectures on "The Care of the Patient" that have been carried out each autumn for the past two years have been arranged for this year according to the following schedule:

Tuesday—October 18—Dr. Edsall.
Thursday—October 20—Dr. John M. T. Finney.
Tuesday—October 25—Dr. Austin M. Riggs.
Thursday—October 27—Dr. C. Macfie Campbell.
Tuesday—November 1—Dr. Charles F. Martin.
Thursday—November 3—Dr. Alfred Worcester.

You may note that there are three distinguished men from elsewhere who will speak this year—Dr. John M. T. Finney, Professor of Clinical Surgery at Johns Hopkins Medical School; Dr. Austin M. Riggs of Stockbridge, and Dr. Charles F. Martin, Dean of the Medical School of McGill University.

You will remember perhaps that the purpose of these lectures is to emphasize the care of the human individual as against the more technical care of the disease.

These lectures are open to the general medical profession.

Very sincerely yours,
DAVID L. EDSALL, M.D., *Dean.*

THE COMMUNICABILITY OF RABIES

The Commonwealth of Massachusetts
Department of Public Health
State House, Boston

September 15, 1927.

Editor, Boston Medical and Surgical Journal:

In view of the fact that there has been some question recently in the minds of lay persons generally, and occasionally in the minds of physicians, as to the possibility of the transmission of rabies from an animal to a human being, I would be glad if you would publish the following statement:

On May 17 a dog owned by Mr. and Mrs. X (all the names in connection with this case are on file in this office) was taken sick and seen by a veterinarian. The veterinarian was so suspicious that the dog showed symptoms of rabies that he removed the dog and had it killed the same day. The head was examined in our laboratory and a positive diagnosis was made on May 19 and confirmed on May 26.

Mrs. X was very fond of the dog and frequently allowed the dog to lick her face and hands. On May 11 Mrs. X was burned rather severely on the back of one or two fingers of one hand. On July 13 Mrs. X died of what was considered to be clinical rabies. Autopsy was done and examination of her brain showed the presence of Negri bodies.

Although there are many similar instances of such a chain of circumstances in the literature, this particular instance ties in all the important facts, namely, a rabid dog which infected through an open wound a person who later died of rabies. Both the brain of the dog and the brain of the woman examined in our laboratory showed the presence of Negri bodies.

Information received from sources which we believe to be reliable directly after a diagnosis of rabies in the dog was made, showed that no one was bitten. Evidently, the dog infected Mrs. X by licking the open wound on her hand while he was in an infectious condition. This case did not receive Pasteur treatment.

Yours truly,
GEORGE H. BIGELOW, M.D.,
Commissioner of Public Health.

LIST OF PHYSICIANS REGISTERED BY THE MASSACHUSETTS BOARD SEPTEMBER 8, 1927

Abramson, Julius, Boston City Hospital, Boston, Mass.
Albertson, Miriam Alverta, Chester Hospital, Chester, Pa.
Allen, Samuel, 38 Pleasant Street, Hyde Park, Mass.
Altman, William Solomon, Boston City Hospital, Boston, Mass.
Ames, Charles Theron, 50 North Main Street, Ipswich, Mass.
Archambault, Henry Allard, 101 Lowell Avenue, Haverhill, Mass.
Attenberg, Samuel Ernest, United States Veterans Hospital, Northampton, Mass.
Bacon, George Sterling, Central Greenwich, N. B., Canada.
Banas, Felicia Ann, 41 Parker Street, Holyoke, Mass.
Barrow, Ellis Dale, 590 Columbus Avenue, Boston, Mass.
Blacker, Samuel Irving, Flower Hospital, New York City, N. Y.
Blyth, Henry Higginson Armond, 82 East Concord Street, Boston, Mass.
Boda, John, 230 West Fifth Street, South Boston, Mass.
Calhoun, Ethel Thirza, Memorial Hospital, Worcester, Mass.
Canby, Joseph Edward, Springfield Hospital, Springfield, Mass.
Carella, Joseph James, 9 Grant Street, Dorchester, Mass.
Carr, Frank Benjamin, Holden, Mass.
Carter, John Adams, Box 23, Saugus, Mass.
Cave, Edwin French, 200 Longwood Avenue, Boston, Mass.
Christie, Welman Blake, 82 East Concord Street, Boston, Mass.
Collins, Dennis Joseph, 85 Monroe Street, Norwood, Mass.
Cote, Gerard, State Hospital, Allentown, Pa.
Cotta, Germain John, 42 Lexington Street, East Boston, Mass.
Cowan, Eleanor Elisabeth, 24 South Street, Concord, N. H.
Cox, Michael John, Boston City Hospital, Boston, Mass.
Creager, Florence Isabelle, 112 Liberty Street, Jamestown, N. Y.
Cronin, Charles Burke, Box 431, Leominster, Mass.
Dame, Lawrence Raymond, Worcester City Hospital, Worcester, Mass.

- DelGratta, Alberto Joseph, 33 Woodville Street, Everett, Mass.
- Desautels, Antonio Paul, 35 Gilead Street, Adams, Mass.
- Douphinet, Otis John, 25 Pearl Street, Franklin, N. H.
- Eades, Marion Fletcher, 221 Longwood Avenue, Boston, Mass.
- Edelmon, Elsa Berger, 20 Ware Street, Cambridge, Mass.
- Elliott, Simeon, Bridgewater Hospital, Bridgewater, Conn.
- Elton, Norman William, 2 Marlowe Street, Dorchester, Mass.
- Farnham, Marynia Foot, 10 Remington Street, Cambridge, Mass.
- Flynn, John Molloy, 9 Waldo Street, Somerville, Mass.
- Gorman, Lionel James, 541 Main Street, Stoneham, Mass.
- Gove, Wilfred Freeman, Providence City, Providence, R. I.
- Grossman, Herman Paul, Massachusetts Homeopathic Hospital, Boston, Mass.
- Guidone, Erel Linguiti, Hampton, Conn.
- Hand, Leo James, 1185 Commonwealth Avenue, Boston, Mass.
- Harissis, John Theodore, 177 Lake Avenue, Manchester, N. H.
- Haysmer, Clyde Albert, Melrose Hospital, Melrose, Mass.
- Healy, James Clarke, 86 Tyndale Street, Roslindale, Mass.
- Hershenson, Bert Barnet, 420 Seaver Street, Grove Hall, Mass.
- Houser, Gerald Frederick, Care of Danvers State Hospital, Hathorne, Mass.
- Ingraham, George Howard, 49 Elm Street, Camden, Me.
- Jepson, Paul Newton, 20 Buckminster Road, Brookline, Mass.
- Johnstone, Mary Kisseleff, 910 Emerson Street, N. W., Washington, D. C.
- Kickham, Charles Joseph Edward, 19 Zamora Street, Jamaica Plain, Mass.
- King, Richard Bruce, Massachusetts General, Boston, Mass.
- Knowles, Charles Augustus, Pondville Hospital, Wrentham, Mass.
- Kopp, Israel, 45 Townsend Street, Roxbury, Mass.
- Lapniewski, Chester Joseph, St. John's Hospital, Lowell, Mass.
- Laplin, Albert Saul, 12 Don Street, Dorchester, Mass.
- Larson, Carl Gustav, 1745 Dorchester Avenue, Dorchester, Mass.
- Lee, Frank Robert, 117 Massachusetts Avenue, North Andover, Mass.
- Legore, Ivanhoe Constantine, 414 Massachusetts Avenue, Boston, Mass.
- Leighton, Leslie Hazelton, Cambridge Hospital, 330 Mt. Auburn Street, Cambridge, Mass.
- Lemaitre, George, 179 Essex Street, Lawrence, Mass.
- Levine, Eva, 1107 Blue Hill Avenue, Mattapan, Mass.
- Levine, Philip, 107 University Road, Brookline, Mass.
- MacLean, Alexander Leslie, 212 Payson Road, Belmont, Mass.
- Malone, Stephen Joseph, 150 Irving Street, Watertown, Mass.
- McCarthy, Thomas S., Medfield State Hospital, Harding, Mass.
- McDonough, Eugene Francis, St. John's Hospital, Lowell, Mass.
- McGovern, Mark Anthony, 99 Pearl Street, Providence, R. I.
- McGovern, Philip Patrick, 87 Vernon Street, Roxbury, Mass.
- McHugh, John Francis, Shelby, Ohio.
- McIntosh, Ronald, Westborough State Hospital, Westborough, Mass.
- Meehan, James Joseph, 17 Bellevue Street, Dorchester, Mass.
- Miller, Israel (dead), 56 Chester Avenue, Chelsea, Mass.
- Morais, Wilfrid Aurelien, 71 Wannalancet Street, Lowell, Mass.
- Muller, Gull Lindh, 4 St. John's Road, Cambridge, Mass.
- Nikie, Anthony Henry, 69 Essex Street, Salem, Mass.
- Nile, Joseph Abbott, 9 Acasia Street, Cambridge, Mass.
- Oddy, John George, Lawrence General Hospital, Lawrence, Mass.
- O'Neil, Arthur William, St. Elizabeth's Hospital, Brighton, Mass.
- Palmer, Mary, 74 Fenwood Road, Boston, Mass.
- Peters, Francis Donald, 82 Otis Street, East Cambridge, Mass.
- Peterson, Thomas Howard, 253 Newbury Street, Boston, Mass.
- Plumer, Herbert Edric, 80 East Concord Street, Boston, Mass.
- Radin, Aaron, 95 Moreland Street, Roxbury, Mass.
- Redmond, James William, Jr., 512 Broadway, South Boston, Mass.
- Reed, Howard Clinton, 265 School Street, Whitman, Mass.
- Restall, Malcolm Morris, Albany Hospital, Albany, N. Y.
- Robinson, Maud Belyea, Talbot Building, Norwood, Mass.
- Sacchetti, James Vincent, 101 Webster Street, East Boston, Mass.
- Sanford, Wallace, 36 Walnut Street, Everett, Mass.
- Saver, Herbert Spencer, Boston City Hospital, Boston, Mass.
- Schleiff, Margot Anna, 34½ West Main Street, Meriden, Conn.
- Scribner, James Merle, Lowell Corporation Hospital, Lowell, Mass.
- Servetnick, Abraham, 82 East Concord Street, Boston, Mass.
- Shea, Daniel William, St. Mary's Hospital, Brooklyn, N. Y.
- Sidebottom, Dorothy Elizabeth, 80 Summer Avenue, Reading, Mass.
- Silverstein, Louis Basil, Beth Israel Hospital, Roxbury, Mass.
- Smith, Edward Mack, Danvers State Hospital, Hathorne, Mass.
- Stobbs, William Malcolm, 816 High Street, Pottstown, Pa.
- Steady, Karl Alfred, 154 High Street, Berlin, N. H.
- Steady, Kenneth Ralph, 154 High Street, Berlin, N. H.
- Suchnicki, Emil Felix, Carney Hospital, South Boston, Mass.
- Swift, William Herbert, City Hospital, Worcester, Mass.
- Taylor, Edward Hanlin, 652 Huntington Avenue, Boston, Mass.
- Tegelberg, Julius John, Worcester State Hospital, Worcester, Mass.
- Teney, Heber Franklin, Danvers Hospital, Hathorne, Mass.
- Tierney, John Paul, 15 Winslow Road, Brookline, Mass.
- Todd, John Joseph, St. Elizabeth's Hospital, Brighton, Mass.
- Tolman, Myer Maurice, 81 Shurtleff Street, Chelsea, Mass.
- Tursky, Helen Barbara, 79 Vine Street, Brockton, Mass.

Waterman, Isidore Hyman, 122 Harold Street, Roxbury, Mass.
Weinert, Thaddues Conrad, 60 Claremont Avenue, Jersey City, N. J.
Weinger, Morris Aaron, 1332 Park Avenue, New York City, N. Y.
Welch, Norman Alphonse, Carney Hospital, South Boston, Mass.
Weller, Theodore Warford, 221 Longwood Avenue, Boston, Mass.
Whitney, Arthur Thomas, Worcester City Hospital, Worcester, Mass.
Wilcox, Oscar, Jr., Nassau, N. Y.

REJECTED APPLICANTS

	Year of graduation
Massachusetts College of Osteopathy.....	1—1923 2—1925 5—1926 5—1927
Middlesex	2—1922 3—1923 2—1925 1—1926
Laval	1—1925
University of Montreal.....	1—1921 1—1924 3—1925
Kirkville Coll. of Ost. and Surgery.....	1—1926 4—1927
Des Moines Still Coll. of Ost.	3—1927
Georgetown University.....	1—1927
Boston P. and S.	3—1927
Chicago Medical School.....	1—1925
Philadelphia Coll. of Ost.	3—1927
Athens Univ.	1—1915
American School of Ost.	1—1921
Kansas City Univ. P. and S.	1—1926
St. Louis P. and S.	1—1923
Total.....	117 Registered
Total.....	47 Rejected

NATIONAL BOARD EXAMINATIONS

The following named physicians have been registered in Massachusetts through recognition of the National Board examinations:

MAY 19, 1927

Chandler, Paul Austin, 23 Bay State Road, Boston, Mass.

JUNE 23, 1927

Reynolds, George Phillips, Johns Hopkins Hospital, Baltimore, Md.

Blackford, Staige Davis, Massachusetts General Hospital, Boston, Mass.

Tiede, Joseph W., Boston City Hospital, Boston, Mass.
Pike, Maurice Mitchell, Hartford Hospital, Hartford, Conn.

Wolff, Harold George, Harvard Medical School, Boston, Mass.

Cook, Robert Louis, Boston City Hospital, Boston, Mass.

JULY 15, 1927

Faulkner, James Morison, Johns Hopkins Hospital, Baltimore, Md.

McClure, William Lionel, Massachusetts General Hospital, Boston, Mass.

May, George Elliott, Boston Lying-in Hospital, Boston, Mass.

SEPTEMBER 8, 1927

Kuhns, John Grove, 300 Longwood Avenue, Boston, Mass.

BOOK REVIEWS

The Life and Work of Patrick Manson. By PHILIP MANSON-BAHR and A. ALCOCK. William Wood and Company, New York. 1927.

This is the story of a pathfinder in medicine, —absorbing both in its romance and human interest. Mere chance took Patrick Manson to China in 1867, shortly after the completion of his meagre schooling. There he labored indefatigably and lovingly among the Chinese for twenty years as general practitioner, as medical reformer and as teacher. Busy as he was, however, he made time for a still greater job; his innate inquisitiveness drew him to the opportunity to study the many diseases to which his neighbors were subjected,—diseases rarely met with in Europe, which, however, made living difficult in the tropics. Barehanded, without any scientific training, but with a fine equipment of intellect, at times reminding one of the great Pasteur, this obscure young man in a remote part of the earth worked so well that he laid the foundation of that branch of the medical sciences known as tropical medicine.

His early interest in the surgical treatment of elephantiasis led him through virgin territory to the great discovery of the intermediation of a particular mosquito in the propagation of filariasis in man. This discovery was significant in itself and far-reaching in its influence in other fields, for Manson by analogy applied the same principle to malaria and largely through his guidance Roland Ross worked out the life cycle of the plasmodium in the mosquito.

In 1889 Manson returned to London and devoted the rest of his life until 1922 to his chosen field of work. Thus through his own work, through his influence on others, and through his development of schools for the study of tropical diseases he actually founded tropical medicine.

Sir Patrick Manson will remain an outstanding figure in the history of medicine, and the story of his life and work is truly inspiring.

How To Make The Periodic Health Examination. By EUGENE L. FISK and J. RAMSER CRAWFORD. MacMillan Co., 1927, 393 pp.

This book is entitled "How to Make the Periodic Health Examination a Manual of Procedure" and is written from the background of the experience of the Life Extension Institute, which is, perhaps, the most extensive in health examinations so far collected. So far as I know, this is the first effort to get together the results and varied literature on health examinations. It contains forms of considerable value to the prospective examiner.

A possible criticism of the book may lie in the repetition of the technique of physical ex-

amination which is available in all the standard works on physical diagnosis. However, it is not amiss to have this brief review readily available with the emphasis on the health point of view.

Section 18 contains the most important function of the health examiner, namely, the counseling of the patient. Here again, there may be some question as to details, but it emphasizes very well the aims of health examination.

In the appendix are given a number of very valuable tables, statistical charts, bibliography and results of examinations. This book is an extremely valuable manual for any physician who may be called upon to do such an examination. It is attractively bound, well printed and on good paper.

Text Book of Pathology. ALFRED STENGEL, M.D., Sc.D., and HERBERT FOX, M.D. 8th Edition. W. B. Saunders Company. 1927. Pp. 1138.

The past few years have seen several new text books of Pathology and several new editions of old standbys making their appearance. The difficulty in any text book, but particularly true in the case of a science with as wide ramifications as Pathology, is to make a text book complete without making it too cumbersome to use. However, most of the recent text books have been very fortunate in safely threading the path between the Scylla of unwieldiness and the Charybdis of incompleteness.

This text book is divided into a section on general Pathology and a section on special Pathology, following the general system in use in presenting Pathology to the students in our medical schools. In the section of general Pathology it would seem as though such fundamental conceptions as the retrogressive processes and the inflammatory and regenerative processes might have been considered earlier than they have been. Throughout, the presentation of material is very logical, and the use of the paragraphic reference style is of considerable value to the student in giving a clear conception of the various pathological processes and disease entities. The section on cirrhosis of the liver is well presented and the abandonment of the terms "hypertrophic" and "atrophic" is a distinct step forward, although these misleading terms are used more or less in the discussion. There are a number of well-chosen illustrations, both gross and microscopic, which are well executed and add greatly to the value. In addition to the usual material presented in text books on Pathology there is considerable amount of space devoted to the nature and action of bacteria. While there are not nearly so many references to the literature as are usually included in text books, those given are well chosen and recent.

This should be one of the most satisfactory of

the pathological text books for the use of students, as it is comprehensive, concise and the material very clearly presented.

Therapeutic Malaria. By G. DE M. RUDOLF. Oxford University Press, London, 1927. 223 pages.

This book is a very timely addition to medical literature. The use of malaria as a therapeutic measure has been in vogue about ten years and was first put into extensive use by Wagner-Jauregg in 1917, when he inoculated cases of general paresis. His results were so good that his method of treatment has extended throughout the civilized world.

Dr. Rudolf began his malaria therapy at the Claybury Mental Hospital in England in 1923. His longest cases, therefore, only cover a period of four years. In spite of this, he reports some very interesting and good results which bear out the original contentions of Wagner-Jauregg. In addition, the author has covered the whole field of malaria, going into details covering the question of immunity, biochemistry, the parasite, the mosquito, etc. The clinical reactions of the treatment are clearly set forth.

No book has ever before covered this subject so well. It is excellently written, clearly illustrated, and is followed by a very good working bibliography. There are many illustrations, including charts of the temperature reactions and one showing the progress made in handwriting of a general paralytic following malaria therapy. The latter is very striking evidence of the successful use of this relatively new mode of treatment.

The book is issued with the very high standard of excellence always associated with the Oxford University Press.

Index and Handbook of X-Ray Therapy by DR. ROBERT LENK, Privat-Dozent of Medical Roentgenology, University of Vienna, translated by T. I. CANDY. Oxford University Press. 120 pp. No illustrations.

X-rays as a therapeutic agent, have passed beyond the experimental stage and are now firmly established as one of the most valuable agents in the treatment of disease. The purpose of this manual, according to the author, is primarily to familiarize the general practitioner with the indications and prognosis of x-ray therapy. Too many physicians, especially in this country, think of the x-ray primarily as a rather doubtful agent for combatting inoperable malignancy, and entirely lose sight of its possibilities in widely divergent fields of non-malignant disease.

Dr. Lenk, as an associate of Prof. Holtznecht who is well recognized as a pioneer and leader in the field of Roentgenology, is undoubtedly qualified to speak with authority. To one unfamiliar with the work and standing of these

men and of the Vienna school, the therapeutic results claimed for x-ray therapy in this volume would seem much too optimistic. For example, under the prognosis of Chronic Tonsillitis we find "Cessation of the recurrent attacks of tonsillitis and the disease which may result therefrom—namely, polyarthritis and recurrent endocarditis—can be completely cured." Many laryngologists undoubtedly would question this. Among other diseases for which favorable results are claimed for x-ray therapy are: acute inflammations, angina pectoris, arthritis deformans and gout, bronchial asthma, exophthalmic goitre, gall stone colic, neuralgia, osteomyelitis, parotitis, prostatic hypertrophy, and various forms of tuberculosis; as well as the skin diseases where the beneficial action of the x-ray is much more familiar.

It is undoubtedly true that in no form of physical therapeutics is detail of technique so essential to success as in x-ray and radium therapy; and it is probable that better results could be obtained if the various methods of technique could be co-ordinated and standardized, and the ever present fear of a possible x-ray burn overcome. The author claims that "with modern technique, e.g. hard, filtered rays, accurate dosage, and sufficiently long intervals, such a danger is absolutely negligible today."

In Part I of the book which is a general section the author discusses:

1. The mode of action of x-rays.
2. Prognosis.
3. Accompanying and subsequent effects of treatment.
4. Adjuvant treatment.
5. Contra-indications.
6. Treatment formula.

The treatment formulae for each disease are very carefully worked out and given in great detail, even including the number of areas to be rayed at each sitting and the intervals between visits. It is unfortunate, however, for American readers that the dosage is given in Holtznecht units as measured by the pastille (Sabouraud), rather than in terms of physical measurements, milliamperes minutes, ionometer, etc., which are more familiar to us and, we are taught to believe, much more accurate. The author says "No direct transference of Holtznecht units in other dosimetric units is possible, as there is no fixed relation between the different dosimeters for all qualities of x-rays." This may be true, but in the reviewer's opinion it would be more accurate and easier for the average roentgenologist to calculate dosage in terms of a physical instrument than to train his eye to differentiate color changes in a patille exposed to the rays.

Part II, the Special Section contains an alphabetical list of more than sixty diseases in which x-ray treatment can be advantageously used. Under each disease we find a paragraph devoted to each of the six headings as mentioned above.

The subject matter is logically arranged, brief, accurate, concise, and intelligible.

The book should be valuable not only as a guide to the general practitioner but also as a quick and ready reference for the specialist. It should be particularly valuable to the dermatologist since the technique used in skin diseases consists of hard heavily filtered rays in contradistinction to the soft unfiltered, or lightly filtered rays commonly used by dermatologists in this country. The clinic from which the author derives his experience has handled a fairly large number of cases over a relatively long period of time, and is favorably known for the accuracy of its observation and scientific methods. It is therefore quite probable that better results can be obtained with less risk by their heavily filtered technique for skin disease than is now obtained by our present methods.

Sheltered Employment for the Tuberculous in the United States. Technical Series No. 7. By H. A. PATTISON, M.D., and PHILIP P. JACOBS, Ph.D.

This pamphlet, No. 7 Technical Series, prepared by the National Tuberculosis Association, is of very real value to all students of the tuberculosis problem and indeed to students and workers in the realm of social economics as well. In it the writers, Drs. Pattison and Jacobs of the National Tuberculosis Association, take up in nine chapters the various experiments and means employed in this country for the employment of persons who have had tuberculosis.

Chapter I considers the subject in general. Chapter II takes up the Altro Work Shops which has been carried on in New York by the Committee for the care of the Jewish tuberculous in New York City. Chapter III takes up the Tomahawk Lake Camp institution for the physical restoration of tuberculous men in Wisconsin which is really a place where tuberculosis sanatoria can send discharged patients for a few months' period of hardening. Vocational training is not taken up here. In Chapter IV the Reco Manufacturing Company is described. This was a project of the New York Tuberculosis Association where ex-tuberculous patients were taught watch repairing, jewelry trades and cabinet work. This was finally taken over by the U. S. Veterans Bureau and later on was given up. In Chapter V the Phipps Institute Workshop is taken up; Chapter VI, the Central New England Sanatorium and Industrial Colony are described in detail; Chapter VII and VIII present the other experiments including the Potts Memorial Hospital; and in Chapter IX various commemorals are drawn.

This pamphlet is of great interest and value. It is a noteworthy fact, however, that no matter how successful these various experiments may be they must perforce reach only a very small group of the ex-tuberculous patients in this country.

The problem of finding employment for the tuberculous must be far more reaching than this. No great results will be obtained until every tuberculosis association in this country maintains a placement bureau in addition perhaps to a shop of some kind of its own by means of which bureau patients can be placed in touch with employers of labor of all kinds where they can be given work on a part-time or piece basis suitable to their handicaps and abilities and yet kept under detailed medical supervision. It is rather a pity that the writers did not call attention to this very important and rather more important field of endeavor.

Manual of Psychiatry. By AARON J. ROSANOFF. 6th Edition. Published by John Wiley & Sons, Inc.

The 6th edition of Rosanoff's *Manual of Psychiatry* may well commend itself to psychiatrists and general medical practitioners. It is inclusive, and presents without prejudice modern psychiatric viewpoints and knowledge.

Part I considers General Psychiatry with an introduction followed by a chapter on etiology and three chapters on symptomatology. Part II relates to Special Psychiatry and considers in twenty-five chapters various forms of mental disease, and concludes with a chapter on a theory of personality. Part III is devoted to the practice of Psychiatry and in eleven chapters a wide range of topics is considered including history taking, psychoanalysis, prognosis, prevalence, prophylaxis, medico-legal questions, mental hygiene of childhood, industrial psychiatry, military psychiatry, and a State mental hygiene program. Part IV recounts special diagnostic procedures in eight chapters including lumbar puncture, Wassermann reaction, intelligence tests, free association tests and a guide to the study of personality. Part V in appendices gives the official classification of mental diseases, tables of height and weight norms, tables of intelligence quotients, and ends with a glossary and index.

Some criticism might be made as to the method of arrangement, and as to the necessity of including some of the material gathered. But these faults are more than counterbalanced by the skill with which the articles from such contributors as de Fursac, Hollingsworth, Mary Jarrett, Neymann, and J. Harold Williams have been synthesized, and edited by Dr. Rosanoff.

Diseases of the Skin and Syphilis. By ALBERT STRICKLER, M.D. F. A. Davis Co. Price \$8.00.

This textbook of dermatology is a strictly conventional textbook, essentially for students and general practitioners. The two most valuable features are, first, the numerous tables of differential diagnosis, which should prove helpful

to the student, and, second, the fact that the prescriptions are so written that the action of each ingredient is indicated. The therapeutic measures advocated are for the most part derived from the author's personal experience. There are very few references. There is an unusually short introductory chapter on anatomy, physiology, pathology and treatment. Nearly 700 pages cover the various skin diseases grouped according to etiology so far as possible, and each is discussed under the usual headings of definition, eruption, etiology, diagnosis, prognosis, and treatment. The great majority of the more than 200 photographs are extremely good, and photographs are a most essential part of any dermatological textbook. The printing and paper are excellent and the numerous sub-headings are helpful.

Lister As I Knew Him. By JOHN RUDD LEESON, Dresser, Clerk, and Medallist, M.D., C.M., Edin., M.R.C.S., J.P. Middx., F.L.S., F.R.A.S. Senior Consulting Physician, St. John's Hospital, Twickenham. Late Demonstrator of Anatomy, St. Thomas's Hospital. William Wood and Company, New York, 1927. 212 pages.

"Any anecdotes of Lister will always be welcome from any of the fast disappearing band of pupils who followed him through his wards, and were eye-witnesses of his wonderful work during his earlier struggles." *Science Progress*, January, 1926.

Leeson was one of those pupils who entered Lister's wards in the Royal Infirmary, Edinburgh, in about 1871 and spent a number of years as Lister's dresser and clerk. He gives a very detailed account of Lister's hospital, his home, his lectures—and draws a splendid picture of the man. In addition one finds a carefully explanatory description of Lister's operations and dressing of wounds.

The book is a superb tribute to Lister by one of his few remaining pupils, full of details and interesting because of them.

Tiger Trails in Southern Asia. By RICHARD L. SUTTON, M.D. Published by C. B. Mosby Company, St. Louis, 1926. 207 pages. Price \$2.25.

The narrative of a profitably spent vacation big-game hunting in Indo-China and India, simply told and well illustrated, the little book is interesting and easy to read. To any one fortunate enough to be able to follow in Dr. Sutton's footsteps the book would give many very useful points. Dr. Sutton is to be congratulated on his ability as a shikari and to be envied the opportunity given to so few of his profession.